Executive Summary

On October 10, 2018 Duke Energy Carolina's LLC (DEC) and Duke Energy Progress LLC (DEP) (collectively Duke Energy or Companies) filed Applications with the South Carolina Public Service Commission (PSC or Commission) in Docket Nos. 2018-321-E and 2018-322-E (collectively Dockets) for Approval of Proposed Electric Transportation Pilot and an Accounting Order to Defer Capital and Operating Expenses (collectively ET Pilots).

Due to the unique and complex nature of the ET Pilots, in a letter dated December 10, 2018, ORS recommended the Commission hold any further action in these Dockets in abeyance to allow ORS an opportunity to facilitate a stakeholder process. On December 19, 2018, the Commission approved ORS's request in Directive Order 2018-832. The goal of the stakeholder process is two-fold: 1) to clarify stakeholder questions and 2) build stakeholder consensus around viable ET Pilot programs that will deliver value. After hosting the workshop, ORS requested an extension of time to submit the final report on April 1, 2019, which was granted by the Commission in Directive Order No. 2019-156. This report provides the details and results of the stakeholder process facilitated by ORS.

In summary, the interested parties in this Docket which participated in the stakeholder process supported Duke Energy's efforts to establish ET Pilots. Stakeholders provided constructive dialogue and feedback on challenges in the electric transportation industry in South Carolina in general and regarding the ET Pilots specifically, and recommended modifications to the ET Pilot programs as proposed.

Duke Energy incorporated stakeholder recommendations into additional modifications to the ET Pilots and has agreed to file amended Applications with the Commission concurrent with this report on April 1, 2019. The stakeholders requested a limited comment period through April 23, 2019, for interested parties to provide comments to the Commission.

Introduction and Purpose

On October 10, 2018, Duke Energy filed Applications with the PSC for approval of Proposed Electric Transportation Pilot and an Accounting Order to Defer Capital and Operating Expenses in Docket Nos. 2018-321-E and 2018-322-E. The ET Pilots would operate for three (3) years and include accounting orders for regulatory and financial accounting purposes authorizing the Companies to defer in regulatory assets the related expenses until their next general rate cases following deployment of the ET Pilots.

The ET Pilots are composed of four (4) programs:

1) Residential Electric Vehicle ("EV") Charging Program (DEC only);

2) EV School Bus ("EVSB") Charging Station Program;

3) EV Transit Bus Charging Station Program; and

4) Direct Current Fast Charging ("DCFC") Station Program.

The Companies estimated the cost of the ET Pilots in South Carolina as approximately $10.4 million over the program's proposed initial three (3) years ($7.1 million for DEC and $3.3 million for DEP). The Companies identified the main goals of the ET Pilots are, among other things, to:

- install a foundational level of fast charging infrastructure across the Companies' service territories in South Carolina;
- study the effects of charging multiple types of electric vehicles;
- develop procedures to ensure cost-effective integration of vehicle charging by actively managing charging loads;
- study how best to support public transit electrification and associated cost savings in South Carolina; and
- study how to ensure electrification projects benefit all customers, including customers who do not own electric vehicles.[1]

Due to the unique and complex nature of the Companies Application for ET Pilots, ORS requested an opportunity to facilitate a stakeholder process which was approved by the Commission on December 19, 2018.

The goal of the stakeholder process was to clarify questions and build consensus around viable ET Pilot programs that will deliver value. The stakeholder process included the following targets and deliverables:

1. ORS will provide an agenda to stakeholders on or before December 21, 2018 to establish the goals of the group and ensure an efficient and meaningful discussion.
2. Stakeholders may submit comments and questions relating to the agenda by January 10, 2019. Comments and questions should be submitted to ORS.
3. ORS will facilitate a Technical Workshop on or before January 30, 2019. The Companies will consider changes to the ET Pilot programs after the Technical Workshop and have committed to sending revisions to the stakeholder group for review and comments.
4. ORS will facilitate a meeting to provide an update on the status of any revisions to the ET Pilot programs on or before February 22, 2019.

[1] DEC Application, Docket No. 2018-321-E, Page 3; DEP Application, Docket No. 2018-322-E, Page 3.

5. A report summarizing the stakeholder process and results will be filed on or before March 1, 2019.

After hosting the workshop, ORS requested an extension to submit the final report on April 1, 2019 which was granted by the Commission in Directive Order No. 2019-156.

This report contains:

1. An overview of the stakeholder process;
2. Information provided to the stakeholders in preparation of the workshop and delivered during the workshop;
3. The results of the stakeholder workshop discussions;
4. An overview of the stakeholder conference call to review Duke Energy's revisions to the ET Pilot programs; and
5. Stakeholder recommendations for next steps.

Overview of Stakeholder Process

With the primary goals of the stakeholder process identified, the stakeholder process was designed to focus on the Duke Energy ET Pilots as filed by the Companies in its Applications. There is broad support from the stakeholders for continued discussions on electrification issue in South Carolina. The ORS Energy Office, in coordination with the Palmetto State Clean Fuels Coalition, committed to continue these discussions with interested stakeholders. The stakeholder process consisted of a Stakeholder Working Group meeting held on January 28, 2019 and a follow up conference call on March 7, 2019. The stakeholders represented in these discussions consisted of a wide array of industry and government organizations (see Appendix A).

Stakeholder Working Group Meeting - January 28, 2019

On December 21, 2018 ORS provided the interveners in these Dockets an overview of the purpose of the Working Group meeting, a draft agenda, and an opportunity to provide written questions for Duke Energy to answer and discuss at the meeting (see Appendix B). ORS received questions from a number of parties, and compiled and submitted the questions to Duke Energy for response.

The purpose of the initial stakeholder meeting was to: 1) determine areas of consensus; 2) identify areas of disagreement; and 3) provide recommendations from the stakeholders to Duke Energy for consideration of program modifications. Prior to the meeting, ORS provided the stakeholders the final agenda and preparation guidelines in order to facilitate an efficient discussion with all participants and effectively cover all topics (see Appendix C); Duke Energy's responses to participants pre-filed questions

(see Appendix D); and Duke Energy's learnings report from the previous electric vehicle pilot program approved by the Commission in Docket No. 2011-114-E (see Appendix E).

The Stakeholder Working Group was facilitated in four (4) parts:

1. Duke Energy provided an Overview of the ET Pilots as filed in its Applications before the Commission (see Appendix F).
2. Question and Answer Review
    a. Duke Energy presented an overview to answer stakeholder questions (see Appendix G).
    b. Participants were provided the opportunity to ask additional clarifying questions.
3. Group discussion to identify areas of consensus, document areas of concern, and determine potential considerations
4. Group discussion to determine if consensus could be reached on stakeholder recommendations for program modifications to be presented for Duke Energy's consideration.

The stakeholder Working Group discussion identified broader electrification policy topics better addressed in a future statewide policy discussion hosted by the ORS Energy Office. A statewide stakeholder group will convene in the second Quarter of 2019 to discuss transportation electrification policy for South Carolina. See Appendix H for a list of the electrification policy topics identified during the stakeholder Working Group meeting.

Results of the Stakeholder Working Group Meeting

Overall, the participants supported Duke Energy's ET Pilots. Most of the participants agreed with the budget as presented, the size of each of the programs, eligibility criteria for participants, and program administration. The majority of concerns raised by stakeholders related to:

- funding for the School Bus and Transit Bus programs;
- the technology required by the ET Pilots for eligibility in the program;
- program goals, oversight, reporting and metrics; and
- rate structure.

The following matrixes were created by ORS to streamline the topics and issues raised during the stakeholder working group session.

1. *Working Group Discussion on Various Aspects of the Program and ET Pilots (see Appendix I)*
   This matrix includes information gathered from stakeholders during the Working Group related to areas of concern, clarifying questions from participants on the topics discussed, and potential considerations that were used to formulate the three (3) ET Pilot Program Modifications as discussed below.

2. *Areas of Disagreement among Participants not included in above considerations (see Appendix J)*

   This matrix provides specific areas of disagreement among the participants as identified during the discussions. These topics were not considered as potential considerations for the three (3) Program Modifications.

The participants reached consensus agreement on three (3) subjects for Duke Energy's consideration to modify the ET Pilots Application filed with the Commission.

1. Establish a Stakeholder Group to meet annually to receive updates of the ET Pilots from Duke Energy, ask questions about the pilot programs, and provide feedback about industry experience and participation. Additional details regarding this proposal can be found in Appendix K.
2. Modify the school bus eligibility criteria to state the requirement for any bus purchased with the incentive funds must have a minimum range of 100 miles.
3. At the end of the ET Pilots, include a requirement that Duke Energy will use the learnings from the ET Pilots to evaluate EV specific Time of Use ("TOU") rates.

Stakeholder Working Group Conference Call - March 7, 2019

A conference call was held with Duke Energy and interested stakeholders to review the results of the stakeholder Working Group meeting, review and discuss Duke Energy's response and proposed ET Pilots modifications, and determine next steps for recommendation to the Commission.

Although consensus was reached during the January 28, 2019 Stakeholder Working Group meeting regarding the three (3) recommended modifications, some concerns were raised by participants on the call regarding the timing of the stakeholder engagement process proposed by Duke Energy and regarding the language proposed by Duke Energy in response to the recommendation for learnings to evaluate EV specific TOU rates. Most participants agreed with Duke Energy's additional modifications to the DC Fast Charging Program and School Bus Programs.

Duke Energy agreed to file amended Applications with the Commission incorporating the modifications as proposed by the stakeholder Working Group on April 1, 2019. Stakeholders requested a limited comment period after these filings and the group agreed on April 23, 2019 as the deadline for final comments in this Docket.

Conclusion

Overall the stakeholder process met the original goal and purpose and provided interested parties an opportunity to interact with Duke Energy. ORS would like to thank all the parties who participated in this stakeholder process for their time and input.

In summary, the stakeholders recommended, and Duke Energy responded, to the following ET Pilot modifications:

1. **Stakeholder Recommendation:** Establish Stakeholder Group to meet annually to receive updates of the Pilot from Duke Energy, ask questions about the pilot programs, and provide feedback to the utility about industry experience and pilot participation.

   Duke Energy Response: The Companies will conduct an ongoing stakeholder engagement process with interested parties. The meetings would be held annually with the Companies providing an update on each of the pilot's four program areas. The interactive meetings will allow participants to ask questions and issue feedback on the progress. The Companies will document the feedback and discussion and include it within the annual report to the Commission.

2. **Stakeholder Recommendation:** Modify the school bus eligibility criteria to state the requirement for any bus purchased with the incentive funds must have a minimum range of 100 miles.

   Duke Energy Response: The Companies will modify the EVSB program tariff to require any bus purchased with the incentive funds must have a minimum range of 100 miles.

3. **Stakeholder Recommendation:** At the end of the pilot, include language in the program that Duke Energy will use the learnings to evaluate EV specific TOU rates.

   Duke Energy Response: The Companies will add language to the program application to include an evaluation of load management methods given data gathered during the pilot in the final report, to include Time Of Use Rates as one of the evaluated load management methods.

Duke Energy also proposed these additional modifications:

1. **DCFC Program** – The Companies believe the DCFC program should be expanded to install sufficient infrastructure to facilitate cross-state EV travel. The Companies are proposing to expand the DCFC Program from 20 chargers in DEC and 10 chargers in DEP to 40 chargers in DEC and 20 chargers in DEP. The expansion would require a revised funding amount of $5,220,000 for DEC and $2,610,000 for DEP. The tariff language will clarify that there will be 20 locations in DEC and 10 locations within DEP with 2 DCFC chargers at each location.
2. **School Bus Program** - The Companies are willing to modify the School Bus program to better reflect the level needed to encourage electric school bus purchases. The Companies therefore propose to increase the rebate provided and reduce the number of electric school buses in the pilot. The rebate will increase from $125,000 per electric bus to $265,000. The number of electric

buses will change from 20 in DEC and 10 in DEP to 10 in DEC and 5 in DEP. The modification will increase $110,000 in DEC and $55,000 in DEP.

Duke Energy has agreed to file amended ET Pilot Applications incorporating these modifications with the Commission concurrent with this report on April 1, 2019.

In conclusion, stakeholders recommended a limited comment period, through April 23, 2019, to offer comments to the Commission related to this report and Duke Energy's amended ET Pilot Applications.

The following organizations were represented in the Stakeholder process:

ABB, Inc.

ADOMANI, Inc.

Alliance for Transportation Electrification

Blue Bird Corporation

Brightfield Transportation Solutions

South Carolina Coastal Conservation League

ChargePoint, Incorporated

Clemson Area Transit

Dept of Insurance

Environmental Defense Fund

EVBox Inc.

Greenlots

Greenville Transit Authority

Lion Electric Company

NovaCHARGE, LLC

Proterra, Inc.

Southern Alliance for Clean Energy

School District of Greenville County

Southeast Energy Efficiency Alliance

Seirra Club

Southern Environmental Law Center

Siemens Digital Grid

Thomas Built Buses

USC Upstate

1401 Main Street, Suite 900
Columbia, SC 29201

Phone: (803) 737-0800
www.regulatorystaff.sc.gov

Duke Energy ET Pilot Stakeholder Work Group

Docket Nos. 2018-321-E and 2018-322-E

Pursuant to Order No. 2018-832, ORS will facilitate a stakeholder process to ensure intervenors in Docket Nos. 2018-321-E and 2018-322-E have an opportunity to request additional information regarding the proposed ET Pilots, provide recommendations for program modifications, and propose next steps for Duke Energy's ET Pilot Programs.

Please contact Sarah Johnson if you have any questions regarding the Duke Energy ET Pilot Stakeholder Work Group at 803-737-0886 or via email at sjohnson@regstaff.sc.gov.

Stakeholder Pre-Work

In preparation of the ET Pilot Stakeholder Work Group discussion, Duke Energy has asked ORS to obtain questions from stakeholders about the programs filed in the Dockets. Please provide any questions you may have regarding the programs as outlined in the applications to ORS no later than January 10, 2019.

Your questions can be sent via email in Microsoft Word format to Sarah Johnson at sjohnson@regstaff.sc.gov.

ORS will consolidate the questions and remit to Duke Energy no later than January 14, 2019.

Stakeholder Work Group Dates

ORS proposes to host the Stakeholder Work Group discussion on either Thursday January 24, 2019 or Monday January 28, 2019. Please indicate which date works best for your group in your Stakeholder Pre-Work email submission to ORS as requested above.

Guidelines for Stakeholder Work Group

- Please review the below purpose and draft agenda.
- Limit your questions to the Programs as presented in the application.
- For each question, indicate which Docket and Program the question pertains to.
- Participation in the Stakeholder Work Group does not prohibit any party from making additional comments or advancing unique positions.
- Any questions relating to overall electrification policy or future plans, for either the State or Duke Energy, will not be included in the final questions sent to the Company for response.

Purpose of ET Pilot Working Group discussion

Purpose of the Stakeholder Work Group discussion to be held on or before January 30th will be to:

1. Determine areas of consensus specific to the Programs as filed
2. Identify areas of disagreement specific to the Programs as filed
3. Provide recommendations for Program modifications, if any
4. Document items of consideration for the Commission

5. Discuss next steps in these Dockets for Commission consideration

These items will be outlined in the Report to be filed by ORS with the Commission on March 1, 2019.

Draft Agenda for Stakeholder Work Group discussion

For each of the Programs offered in the Pilots, the following components will be discussed:

1. Purpose of Programs
2. Customer/Participant Eligibility
3. Program Terms and Conditions
    a. Charging Equipment
    b. Metering Equipment and/or Grid investments
    c. Customer and Company obligations
    d. Rates
4. Incentives
5. Program Costs and Cost Recovery
6. Data Collection
7. Learnings and Reporting

Duke Energy ET Pilot Stakeholder Work Group

Meeting Information and Agenda

Meeting Information

Date: January 28, 2019

Time: Registration will begin at 8:30am
Meeting will begin promptly at 9:00am

Venue: The meeting will be held in the **Hearing Room** at the Public Service Commission offices located in the Saluda Building of the Synergy Business Park off of Bush River Road in Columbia, SC.

Address: The Public Service Commission of SC
101 Executive Center Dr, Suite 100
Columbia, South Carolina 29210

Call Instructions:

1. Please choose the access number local to you
   803-726-9796 (Columbia area or out of state)
   864-908-3279 (Upstate area)
   843-737-7035 (Lowcountry area)
2. Please follow the voice prompts and, **when asked, enter the Code 574540 followed by the # key.** You will be connected to the conference, if your Code is correct. If you are disconnected for any reason, repeat instructions above.

Tips to Improve Call Quality
When you are not speaking, please mute your phone.
Please use land lines instead of cellular phones when possible.

Logistics:

- Wifi is available in the hearing room. Login information will be provided prior to the meeting.
- Food and drinks are not permitted in the PSC Hearing Room, except for water bottles.
- Drinks and snacks will not be provided during the meeting.
- Participants will be responsible for lunch. There are local and fast food establishments within a short drive of the business park.

Duke Energy ET Pilot Stakeholder Work Group

Meeting Information and Agenda

Preparing for the Work Group discussion

Purpose of the Stakeholder Work Group discussion will be to:

1. Determine areas of consensus specific to the Programs as filed
2. Identify areas of disagreement specific to the Programs as filed
3. Provide recommendations for Program modifications, if any
4. Document items of consideration for the Commission
5. Discuss next steps in these Dockets for Commission consideration

Due to significant time limitations for accomplishing this purpose, please consider the following meeting preparation guidelines to streamline your talking points and issues to make the most effective use of our time together.

Meeting preparation guidelines:

1. **Review the applications** that Duke Energy has filed with the Public Service Commission, including the program tariffs which outline the details of each program. The applications and exhibits, including the proposed program tariffs, are located on the Public Service Commission's docket management system website at https://dms.psc.sc.gov/Web/Dockets.
2. **Read** the responses Duke Energy has provided to the stakeholder questions submitted.
3. **Prepare** your position and talking points for the meeting. Consider using the various program tariffs as your guide, along with the verbiage in the application and the answers to stakeholder questions to:
    a. **Determine** all program elements that you agree with or that do not impact your position on that specific program.
    b. **Highlight** any program element with which you require additional clarification or further information prior to determining your position.
    c. **Identify** any program element that you do not agree with or you feel could be improved.
    d. **Assign** a priority and criticality to each of the program elements you identified in step c above. This will help you determine your flexibility in potential resolution, and how much time and energy to devote to the topic in the workshop discussions.
    e. **Document** your recommendation for the program elements identified in step c, spending more time on those items you have assigned a more critical value or higher priority.
4. For elements of the Pilot Program outlined in the application but not specifically addressed in the various proposed program tariffs, follow a similar methodology for determining areas of concern, assigning priority, and documenting your recommendations.

Duke Energy ET Pilot Stakeholder Work Group

Meeting Information and Agenda

Agenda

8:30 – 9:00 am	Registration	
9:00 – 9:30 am	Welcome and Purpose	Sarah Johnson, ORS
9:30 – 10:00 am	Overview of Proposed Programs	Lang Reynolds, Duke Energy
10:00 – 10:30 am	Review Submitted Questions and Answers	Lang Reynolds, Duke Energy
10:30 – 10:45 am	Break	
Discussions to identify consensus and document areas of concerns		Facilitated by Sarah Johnson
10:45 – 11:00 am	Goals and length of overall ET Pilot Program	
11:00 – 11:15 am	Oversight, Learnings and Reporting	
11:15 – 11:30 am	Residential Charging Pilot Program	
11:30 – 11:45 am	School Bus Pilot Programs	
11:45 – 12:00 pm	Transit Pilot Programs	
12:15 – 1:30 pm	Lunch Break	
Continue Discussions to identify consensus and document areas of concerns		
1:30 – 1:45 pm	DC Fast Charging Program	
Discussions to document potential program modifications		Facilitated by Sarah Johnson
1:45 – 2:00 pm	Review discussion and ensure all items have been identified	
2:00 – 3:00 pm	Discuss potential program modifications to address areas of concern	
3:00 – 3:30 pm	Wrap up	

Duke Energy ET Pilot Stakeholder Working Group Participant Questions

2018-321-E DEC Program

Residential EV Charging Program

1. Why does only the application for Duke Energy Carolinas (in Docket 2018-321-E), and not the application for Duke Energy Progress (in Docket 2018-322-E), contain a Residential EV Charging Program component?

   As of the end of October 2018, DEP estimates there are only 21 EVs registered in the DEP SC service territory.

   In order to limit the overall cost of the Pilots, the programs included were limited to those which were determined to be the most essential to supporting EV adoption and providing cost savings and emissions reductions benefits to the greatest number of customers. The School Bus and Transit Bus programs are included to provide proportionate cost savings and emissions reductions benefits to DEP public agencies as those provided to DEC. The DC Fast Charge program is included to install a foundational level of infrastructure to support long-distance travel. In order to fund those programs at appropriate levels, the Residential EVSE Rebate was eliminated in the DEP Pilot.

2. Page 10 of the Duke Energy Electric Transportation Pilot application refers to "programmatic procedures and features to successfully implement utility-managed charging to bring these potential benefits to South Carolina customers." Can Duke provide an example of what these procedures and features might be?

   DEC intends to test different methods of actively managing customer EV charging load in order to determine best practices for future programs. Such procedures and features may include direct load control similar to traditional demand response programs, where charging power is reduced or curtailed completely for short periods of time. Such features may also include behavioral methods such as sending messages to participants notifying them of certain times of day to avoid charging.

3. See Attached.

4. Regarding the qualification of chargers to make them eligible for rebates, is Duke considering open technical standards for data communications, such as OCPP?

   Yes. DEC intends to require OCPP 1.6 as a minimum standard for eligible EVSE.

5. Refer to page 9 of the Application. The Company states that "the Company will provide a rebate and ongoing quarterly participation payments for up to 400 residential customers installing qualifying Level II charging equipment in exchange for utility management of home charging during defined hours."

   a. Is the Company willing to require that program participants take service on an applicable time-of-use electricity rate in addition to requiring that customers agree to participate in a demand response program?

The purpose of the Pilot is to gather data on customer charging behavior and the ability of customers to participate in EV charging load control events. Requiring a time of use tariff would skew the data in such a way that DEC would not be able to establish baseline charging behavior. Therefore, DEC posits TOU is not appropriate for this Pilot, but would consider TOU in the future.

6. Due to limited application in the residential context, no approved utility program to-date has required Open Charge Point Protocol use as an eligibility requirement to receive financial incentives on charging equipment purchased by participants. Can Duke Energy explain the purpose of this requirement, or consider removal of that requirement to enable the widest possible vendor participation in the program?

   The purpose of requiring open standards like OCPP is to eliminate the risk to customers. If a manufacturer of a charging station goes out of business, changes terms with customers, or decides not to support a product, program participants need to have the ability to find support elsewhere. Without that flexibility, customers are at risk of funding charging station incentives that are unable to participate in the program.

   Does DEC have any research, studies, data, or analyses that indicate that the $500 rebate and $41.61 quarterly payment are sufficient to encourage residential homeowners to install charging infrastructure?

   Yes, the residential rebate level was determined based on data from the Company's previous Charge Carolinas Study as well as current industry studies.
   Over the full 3 years of the Pilot, customers may receive up to a total of $1,000: $500 upfront and a total of $500 over the following 3 years. This $1000 incentive level was sized to offset ~50-100% of the cost of purchase and installation of a smart, networked Level 2 EVSE.
   The Company's previous Charge Carolinas Study, completed in 2014, found that the average EVSE installation totaled $2,911 including $1,965 for the EVSE hardware and an average of $947 for installation. However, these costs included ongoing EVSE network fees and un-installation costs. Therefore, the cost of just hardware and installation are likely lower, and competition in the market has reduced hardware costs since the start of the Charge Carolinas Study.

   A more recent meta-analysis from CERES (cited in the Company's application filing) found the total hardware plus installation cost for an L2 Residential EVSE averaged $1,400.

7. Why is DEC capping the residential program at 400 customers?

   DEC is capping the residential charging program to 400 customers in order to limit the overall cost of the DEC Pilot. If the Pilot is successful, DEC may seek authority to expand subscription with future proposals.

8. Duplicate - Removed

2018-321-E DEC & 2018-322-E DEP Programs

Questions applicable to All Programs

1. With regard to each program element involving charging infrastructure, will there be a variety of EV charging networks and equipment and will participants have the ability to choose among the qualified vendors?

In the Residential Charging, School Bus, and Transit Bus programs, participants receiving rebates will have the ability to choose equipment among qualified vendors. In deploying the foundational DC Fast Charge network, DEC and DEP will similarly review a variety of networks and equipment for the program during the competitive bid process.

2. Refer to page 5 of both Applications. The Company states that it will file "annual reports" with the Commission.

    a. What data/metrics will be included in the annual reports?

    DEC and DEP will provide data and metrics for each of the four programs. The first year will primarily gather data to create an baseline as we have not gathered EV charging data since the original Charge Carolinas Study. Basic programmatic data will be reported such as the number of rebates issued, number of charging stations deployed, amount of energy used, when energy is used, and the average load curve for each program. No load control events will take place during the first year.

    The second and third years will include load control events for the Residential EV Charging Program. This will provide additional data such as: the proportion of customers available for load control at different times of day, the proportion of customers who opt out of load control events, and the actual amount of load reductions achieved during events. The EV School Bus Program will demonstrate the ability to dispatch power in a bi-directional manner when the buses are not in use for school transportation.

    For the DCFC Program, DEC and DEP will report total installation costs for each station, rates charged to drivers, and utilization rates of the network.

    Education and outreach initiatives will be tracked and detailed in the reports.

    All other program costs including project management, network management fees, education and outreach will be detailed in the annual reports along with estimated emissions reductions associated with EV deployment facilitated by the Pilots.

    The reports will also include any additional details deemed pertinent as discovered through the course of the programs or as otherwise ordered by the Commission.

    b. Will the data/metrics be the same as the Company intends to report in its final report (page 15)?

    Yes. The final report will contain the same data/metrics as the annual reports.

    c. Will the annual reports be made public?

    Yes. The annual reports will be made public.

3. Refer to page 13-14 of the DEP Application and page 15 of the DEC Application. The Company states that it will file a final report with data on "overall cost figures, load profiles of residential, DCFC and public transit charging; cost savings of public transit agencies; information about charging station costs; insights learned by the Company regarding the effect of the program on the electric vehicle supply equipment ("EVSE"); and EV market development in South Carolina."

    a. Is the Company willing to also provide data on: (1) the prices charged to EV drivers at DCFC stations; (2) managed charging response events and customer participation for the Residential Charging Program; and (3) to collect the same information about the School Bus Charging Program as the Company plans to collect for the Transit Bus Charging program?

Yes. DEC and DEP are willing to provide data on prices charged, managed charging response events, customer participation in Residential Charging Program (aggregated data), and will collect the same usage data for School and Transit buses (Transit does not participate in V2G though).

4. Given the nature of the Pilot to learn and gain understanding, would Duke Energy be open to establishing a program advisory committee consisting of various industries and stakeholders to review updates from the Pilot and solicit feedback on an ongoing basis?

   DEC and DEP are open to establishing a program advisory committee in the final year of the programs in advance of filing the final Report.

5. How does DEC and DEP plan to conduct its marketing and outreach programs?

   DEC and DEP believe that education and outreach are essential components to the success of the proposed Pilots. Historically, awareness has been a major barrier to mass adoption of electric vehicles, especially as prices have come down and EVs are no longer out of reach for the average consumer. Robust participation by customers is needed to ensure potential system benefits of increased EV adoption are realized, therefore education and outreach activities are a significant portion of the program. DEC and DEP currently educate customers on the benefits of electric vehicles through standard marketing channels such as the Duke Energy website. Customers who visit www.duke-energy.com can learn about EVs, calculate the savings associated with their operation, and benefit from financial incentives offered by car companies and other industry partners.

   Draft Education and Outreach Plan – Subject to change

Communication Method	DEC Est Budget 2019-2021	DEP Est Budget 2019-2021
Events and Outreach	$ 84,000	$ 36,000
Advertising Brand and Media	$ 210,000	$ 90,000
Collateral and Promotional Items	$ 21,000	$ 9,000
Auto Dealers and Electricians	$ 105,000	$ 45,000
Total	$ 420,000	$ 180,000

   Events and Outreach may include Ride and Drive events, Lunch and Learn programs, conference participation, and speaking engagements with interested civic groups. Messaging to residential targets can be achieved via email, newsletters, and social media.

   Advertising Brand and Media efforts may be achieved through typical channels such as radio, newspaper, and billboards as well as digital marketing using social media channels.

   Collateral and Promotional Items will support Events and Outreach by offering printed materials and educational products.

   Auto Dealers and Electricians are key stakeholders and present the opportunity of becoming educators themselves. The intent is to create highly educated ambassadors who understand and evangelize the benefits of electric vehicles.

DEC and DEP are also open to ideas that increase interest and participation including collaboration with environmental NGOs. As stakeholder communication is implemented, modifications may occur.

6. Who does DEC and DEP plan to target with its marketing and outreach programs?

   Please see above #5.

7. To what extent and in what ways were low-income populations or underserved communities considered by DEC and DEP in developing its Pilot Program?

   The main goal of the proposed Pilots is to lay a foundation for future higher growth of electric vehicle adoption, thereby efficiently increasing utilization of the electric system and putting downward pressure on rates over the long term. This potential future downward rate pressure benefits all customers regardless of whether they personally drive an EV or not.

   Furthermore, the EV School and Transit Bus programs are specifically designed to provide benefits to a broad cross-section of customers including low-income populations.

   The proposed Pilots are based on our evaluation of which programs can drive EV adoption in a manner that benefits all customers. If state policy dictates something else, we are happy to discuss at that time but it is not necessary for the Pilots.

8. What are the purpose, plan, and audience for DEC's and DEP's education and outreach funding?

   Please see #5 above in this section.

9. How did DEC and DEP determine that the Pilot Program data points are relevant and necessary?

   Based on our research, we believe the electrification of transportation can be beneficial endeavor for all ratepayers and therefore, relevant and necessary. The data points supporting that goal are documented in a report conducted by MJ Bradley and Associates. (This report was filed as Exhibit A to the DEC and DEP applications and can be found at https://dms.psc.sc.gov/Attachments/Matter/6b990987-e25e-4897-85cd-de6cfd21be42 . The study estimated the costs and benefits of increased adoption of plug-in electric vehicles in the state of South Carolina. The study estimated the financial benefits that would accrue to all electric utility customers in South Carolina due to greater utilization of the electric grid during low load hours, and resulting increased utility revenues from PEV charging. In addition, the study estimated the annual financial benefits to South Carolina drivers from owning PEVs—from fuel and maintenance cost savings compared to owning gasoline vehicles. The study also estimated reductions in gasoline consumption, and associated greenhouse gas (GHG) and nitrogen oxide (NOx) emission reductions from greater use of PEVs instead of gasoline vehicles.

10. What specific testing of utility-managed charging and V2G capabilities will DEC and DEP conduct?

    DEC and DEP intend on managing the load of participants in the Residential Charging, School Bus, and Transit Bus programs. Load management could include viewing current load status of individual charging stations, understanding the daily load profile of area charging, determining and setting curtailment thresholds, and when thresholds are met, sending messages to participants notifying them of curtailment events. Residential Charging participants will be allowed to opt out three times per month. If they choose to opt out more than three times in a month, they will forfeit their quarterly incentive payment. School Bus and Transit bus participants will allow DEC and DEP to reduce charging speeds, up to and including full

curtailment, provided such control activities don't impact the necessary duty cycle of any transit or school bus.

The EV School Bus Program will demonstrate the capability and feasibility of an EV school bus to act as a grid asset by dispatching power back to the grid or building when not in use for school transportation. Following the initial 1-year data gathering period, the EVSB Program will transition to the demonstration phase which will include a limited number of controlled events where the bus operates in V2G mode, dispatching power back to the building location where it is parked.

11. Will DEC and DEP publicly report these data and lessons learned on a periodic basis and at the Pilot Program's conclusion?

    Yes. DEC and DEP plan on reporting annually and within 180 days of the Pilot Program's conclusion.

12. DEC and DEP state that if it determines that the Pilot Program is ready for wider subscription, it will propose such a program to the Commission that incorporates lessons learned. Is there an established threshold that DEC and DEP anticipates would trigger that the Pilot Program is ready for wider subscription? If so, what is that threshold?

    No.

13. What knowledge and lessons gathered by the prior 2011 pilot program were leveraged or used to develop the 2018 Pilot Program?

    The Charge Carolinas Study helped DEC and DEP prepare for the proposed 2018 Pilots in several areas including understanding customer charging station usage, average costs of charging stations and the average cost to install the charger. For example, this data was used to help determine the size of the proposed rebate. Since 2011, the market has changed with more vehicle product offerings, larger batteries, increased range, and therefore we expect charging patterns and behaviors may have changed. The 2011 data will be used as a reference point but the new technologies and options requires a refresh of data to more accurately understand the impact electric vehicles will have on the grid.

14. Can DEC and DEP explain how the results from the prior 2011 pilot program compare to the information sought in the 2018 Pilot Program?

    The main difference between the two programs is that the 2011 Pilot program gathered baseline data on station installation cost and customer charging data while the 2018 Pilots will update this baseline data given market advancement and also expand to include testing of EV charging load management capabilities. In addition to the Residential Charging program, the proposed 2018 Pilots add EV School Bus, EV Transit Bus, and DC Fast Charging programs as well.

15. Removed – See Attached

16. Explain how the Companies arrived at the spending amount for each program. What other program alternatives did the Companies consider? What methods did Duke Energy use to determine the cost of each program as the best use of rate-payer funds to achieve the goals as stated in the Applications?

    DEC and DEP sought to balance establishing programs with sufficient funding to encourage market growth and gather enough data to develop best practices and future programs Overall,

DEC and DEP proposed modest Pilots. The Companies feel the modest amount of the Pilots will alleviate some of these concerns but still provide value to other customers and the State.

Establishing EV programs is necessary for DEC and DEP to stay ahead of increasing EV adoption and determine best practices for integrating charging load from a wide variety of vehicles. The proposed programs are designed to be large enough to gain significant results while also containing reasonable limits to control overall costs.

The methods for determining individual incentive levels are explained on Page 2 of these responses. Once the incentive levels were determined, DEC and DEP calculated participant levels in light of the goals of supporting vehicle adoption while also limiting overall cost.

17. Would Duke Energy consider reallocating funds for the School and Transit programs to the DC Fast Charging program?

    No, not at this point.

18. How would a denial of the cost deferral request by the Public Service Commission impact Duke Energy's implementation of these programs?

    If the cost deferral request is denied, the Companies would need to evaluate whether pursuing the programs are feasible or desirable at that time given the regulatory lag that would occur.

19. Explain the statement in the applications on page 4 that "approval of the Pilot is critical to putting the Company's proposed plan in place prior to the finalization vehicles has a net of the State's BMP". Why is it critical that the Pilot be approved by the Public Service Commission before the final requirements, process, and potential impacts on the various market segments in the BMP is known?

    DEC and DEP need a firm proposal to provide to the Department of Education and Department of Insurance in order to succeed in dedicating funding from the VW Settlement Environmental Mitigation Trust to EV school and transit bus deployment.

20. What impacts will other policy discussions such as within the State Energy Plan process have on Duke Energy's implementation of this program over the next three years? How will those and other discussions or policy decisions impact the lessons learned of this pilot?

    The proposed Pilots are designed to complement and support the State Energy Plan particularly, in its efforts to reduce emissions. DEC and DEP are open to working to incorporate guidance from the State Energy Plan as it is developed, as well as from other stakeholders, to modify future ET programs and also integrate lessons learned into policy decisions.

EV School Bus Charging Station Program

1. How does Duke Energy anticipate that both Electric Vehicle School Bus Programs will serve as a clean transportation educational resource to the community and school districts?

   The Electric School Bus program will serve as an immediate educational resource to the students who ride the buses and a larger resource to all South Carolina students who benefit from the Pilots. During the Pilots, DEC and DEP will promote the Pilots within the participating school districts and a portion of the Education and Outreach activities will be dedicated to highlighting the EV school buses at schools throughout the community.

2. What is the timeline for the finalization of the Beneficiary Mitigation Plan (BMP) for submission by the state of South Carolina? Describe the discussions that you have had to date with SCDOI (Insurance) and SCDE (Education), and which state agency is leading this effort. What is the total allocation of funding for South Carolina by the Mitigation Trust, and how flexible is the funding and allocation process once a plan is developed and more toward implementation?

   The total amount of the Volkswagen Settlement for South Carolina is $33,895,491 and the Beneficiary Mitigation Plan (BMP) for the state can be found at https://doi.sc.gov/DocumentCenter/View/11323/Beneficiary-Mitigation-Plan

   The Department will be issuing a series of requests for applications which will be published on the VW website and sent to interested parties. As of this response, the date for submitting project applications has not been set by the Department of Insurance. DEC and DEP have met with the Department of Insurance and the Department of Education. Both agencies expressed interest in the proposed EV School Bus Pilots but did not comment extensively due to the fact that the Pilots are not yet approved programs.

3. During what years (for the purpose of ratemaking, the rate years) do you anticipate this funding to be available for vendors and contractors, such as Duke?

   This question is unclear – what "funding" is the question referring to?

4. How would you (Duke) structure an RFP for the charging infrastructure, and would it be similar to the process that you used for choosing vendors and contractors in Florida?

   Yes. The structure of the RFP will be like the one used in Florida, which follows standard, Duke Energy procurement policy. Duke Energy procurement policy may be found at https://www.duke-energy.com/partner-with-us/suppliers .

5. As you (Duke) state in your filing, there are over 500 diesel powered buses being used by school districts in South Carolina that are quite old, from vehicle years 1988 and before. If this program proves to be more successful than you think (e.g., 20 buses to procure on a first-come, first-served basis for DEC), what would be your plan or strategy at that point? To try to persuade DOI and DE to allocate more funding for the school e-bus program and change the BMP, to consult with ORS and the Commission about strategies and next steps, or to simply note that in the reporting to the Commission?

   The Pilots are designed to run for three years at which time a final report will be issued and next steps will be considered for future programs.

6. To what extent would V2G capability be required as a condition of the electric school bus incentive program? For all participants and/or buses?

   DEC and DEP intend to require V2G capability for all school buses participating in the program.

7. Are the school bus rebates sufficient to encourage investment? What research is DEC and DEP relying on to inform this program design?

   The proposed rebate is valued at $125,000 to offset a significant portion of the incremental cost of an electric school bus and associated charging infrastructure. Based on market data the cost premium of an electric school bus and charging infrastructure is approximately $200,000, therefore the utility rebate was designed to cover ~50% of the incremental cost premium. The company is proposing combining this utility rebate with Volkswagen Settlement Environmental Mitigation Trust Funding and other state or municipal funding.

The rebate amounts proposed in the Electric School and Transit Bus programs are a starting point and current best estimate by the Companies. In addition to researching the grid impacts of charging these heavy-duty vehicles, the Pilots will also drive a better understanding of appropriate levels of financial incentives from the electric utility. The number and amount of each rebate may be reviewed periodically and may be adjusted if participation does not meet the proposed targets.

EV Transit Bus Charging Station Program

1. What is the basis of the $55,000 rebate level (also, for the $125,000 for the school buses above) – supposedly to try to make the upfront capital costs for E-buses compared to traditional diesel-powered buses? What today is roughly the price difference between the two types of buses for a procurement of this magnitude (e.g., 20 buses for DEC)?

   The amount of the $55,000 Electric Transit Bus rebate was based on market data related to the cost to purchase and install a EV transit bus charger. Therefore, the rebate is sized to pay for the charging station and associated infrastructure, not the transit bus.

2. Have Clemson Area Transit and Greenlink as transit agencies operating in South Carolina already received authority from FTA to proceed with such an E-bus program, and do they have a contract yet? Briefly describe the status of those discussions or negotiations.

   The Clemson Area Transit and Greenlink are best suited to provide answers regarding their discussions with the FTA and potential contracts. The Companies have had discussions with both agencies explaining our proposed Pilots and both agencies have submitted letters of support for the Pilots in dockets 2018-321-E and 2018-322-E.

3. The charging data derived from this pilot program ("big data") will be one of the major assets for the transit agencies to use for its operations, but also for Duke to be able to use in order to gauge charging behavior both by location and time, and the operation of a reliable distribution grid without having reliability issues or unplanned distribution upgrades. How will it be ensured that Duke will have full access to this data?

   DEC and DEP will require access to the data in exchange for participation in the programs.

4. What sort of "testing" is envisaged by Duke and the transit agencies during this pilot program? Some sort of V2G (vehicle to grid) functionality in which Duke can pull energy from the batteries in the buses during periods when the buses are not being operated, and under what terms and conditions? Or would it be more similar to a traditional DR (demand response) type functionality in which price signals are sent from Duke to the transit agencies, assuming they opt in, and then the customer responds?

   The EV Transit Bus Program does not currently include any V2G or load control testing. Transit bus duty cycles imply that the majority of transit bus charging will occur off-peak, when there is no value to charging as a load management resource. Therefore the Pilots will simply gather charging data to establish a baseline load curve for EV transit buses across DEC and DEP's territories.

5. One of the Commission's role is to ensure that ratepayer-funded infrastructure is allocated and used by all classes and incomes of ratepayers, including low and moderate (LMI) income

populations in South Carolina. How do you believe that these programs will benefit the LMI populations?

The main goal of the proposed Pilots is to lay a foundation for future higher growth of electric vehicle adoption, thereby efficiently increasing utilization of the electric system and putting downward pressure on rates over the long term. This potential future downward rate pressure benefits all customers regardless of whether they personally drive an EV or not.

Furthermore, the EV School and Transit Bus programs are specifically designed to provide benefits to a broad cross-section of customers including low-income populations.

The proposed Pilots are based on our evaluation of which programs can drive EV adoption in a manner that benefits all customers. If state policy dictates something else, we are happy to discuss at that time but it is not necessary for the Pilots.

6. Are the public transit rebates sufficient to encourage investment? What research is DEC and DEP relying on to inform this program design?

   The proposed electric transit bus rebate was sized to offset 100% of the cost of purchase and installation of a DC Fast Charger used in depot charging of an electric transit bus. This incentive amount was calculated using industry data from installations within the Companies' service territories.

   The rebate amount proposed in the Transit Bus program is a starting point and current best estimate by DEC and DEP. In addition to researching the grid impacts of charging these heavy-duty vehicles, the Pilots will also drive a better understanding of appropriate levels of financial incentives from the electric utility. The number and amount of each rebate may be reviewed periodically and adjusted as necessary if participation does not meet the proposed targets.

Both EV School Bus and EV Transit Bus Charging Station Programs

1. Refer to page 10 of the DEP Application and page 12 of the DEC Application. The Company states that it "believes there are significant potential operational cost savings" for electric buses used in its service territory."

   a. Has the Company analyzed transit or school bus charging scenarios under its applicable commercial and industrial rates?

      Yes

      i. If yes, is the Company willing to share its analysis?

      Yes.

      ii. If not, is the Company willing to conduct such an analysis?

   b. Is the Company willing to support a stakeholder review of its applicable rates for medium- and heavy-duty charging?

      DEC and DEP are confident that its current rates are well-suited to medium and heavy-duty charging. If there are stakeholders who feel that this is not the case, the Companies are open to reviewing evidence that current rates are not supportive.

2. For the EV Transit Bus and EV School Bus Charging Programs, is the Company willing to lead a stakeholder process to inventory the Company's existing commercial and industrial rates that may apply to charging of medium- and heavy-duty vehicles, and reform or replace those rates as necessary to support charging use cases?

   DEC and DEP have already performed analysis on existing rates and found that they provide significant savings when compared to diesel and other liquid fuels. If stakeholders feel that this is not the case, DEC and DEP are open to reviewing evidence that that current rates are not supportive.

3. What research, studies, data, or analyses helped inform the proposed school bus and public transit rebate amounts?

   Duplicate – see above.

4. Did DEC and DEP consider additional ways to encourage schools and transit providers to purchase electric buses beyond rebates, such as through on-bill financing programs, time-of-use rates, or by providing the necessary infrastructure?

   DEC and DEP are not necessarily interested in on-bill financing, but regardless, the feedback received from customers is that there is no interest in this structure due to the fact that municipal agencies can borrow at attractive interest rates below what could be offered by the utility. Both Time Of Use rates and infrastructure are components of the proposed bus programs. Time Of Use is currently available and will be recommended to Pilot participants while the rebates previously described offer infrastructure from the utility.

5. How did Duke Energy determine the use of rate-payer funds was the most appropriate funding source for these programs? What other funding sources were considered? Explain Duke Energy's reasoning for investing rate-payer funds in non-utility equipment such as buses.

   DEC and DEP believe ratepayer funds to be appropriate because increased utilization of the electric grid from increased EV adoption can benefit all ratepayers. These potential long-term benefits are documented in a report conducted by MJ Bradley and Associates. (This report was filed as Exhibit A to the DEC and DEP applications and can be found at https://dms.psc.sc.gov/Attachments/Matter/6b990987-e25e-4897-85cd-de6cfd21be42 .

   Using the example of buses, the Companies estimate that each transit bus provides between $50,000-$100,000 of total NPV net revenue in excess of the cost to serve. Therefore a $55,000 rebate is likely justified based on the net revenue from charging alone, even ignoring other benefits.

   In the case of DC Fast Charging, the Companies have performed analysis showing that operating these stations is not commercially viable, which explains why so far limited deployment has occurred. A utility program can install these chargers where they are needed but not profitable, allowing the EV market to develop and efficiently increase electric system utilization.

6. Would Duke Energy consider removing the rebate for the buses and only offer rebates for the charging stations and necessary infrastructure? How would this change impact the goals and potential learnings of the programs?

   Not at this time. Removing the bus rebates would result in significantly fewer electric buses deployed in South Carolina over the near term. Without buses deployed on the DEC or DEP

system it is not possible to gather data on the grid impacts of charging these vehicles or develop best practices to integrate this load or prove out the value of using school bus batteries as grid resources.

7. Will Duke Energy monitor applications to ensure rebates are not paid over and above the actual cost for equipment and installation?

   No - the rebates have already been sized below the Company's current estimates for total cost of deployment for school and transit buses and associated infrastructure for vehicles which are much more costly to deploy than traditional diesel. Therefore any rebate amount remaining following equipment installation may be applied to the cost of the vehicle.

8. How will Duke Energy coordinate rebates for equipment and installation if that equipment and installation is included in a bid for Beneficiary Mitigation Plan funds and eligible for a 100% payout of those funds?

   In the case of the school and transit bus programs, the Companies understand that utility program funding must be incremental to Mitigation Trust funding in order for these projects to occur. In the event that a project is funded at 100% by the mitigation fund, this funding will offset any costs accrued by the program.

DC Fast Charging Station Program

1. For both DC Fast Charging Station Programs, what sort of public signage and visual on-site appeal does Duke Energy plan to use to promote awareness and draw attention to the new charging resources? Is this expected to be a component of the Education and Outreach program/budget?

   Most EV drivers use smartphone applications such as PlugShare to find EV chargers. The Companies will ensure the DCFC stations are correctly listed on PlugShare and other apps. In terms of physical signage the stations will be prominently branded to ensure visibility.

2. For both DC Fast Charging Station Programs, does Duke Energy intend to pilot any sort of load management strategies?

   DC Fast Chargers are intended to function similar to gas pumps, where the customer expects the fastest possible "fill up" in the shortest amount of time. Due to the nature of this it is not appropriate to conduct load management at DCFC stations unless there is no impact to the customer experience. The Companies plan to use the data from the Pilots to determine if it is possible in the future to conduct load management at DCFC without impacting the customer experience.

3. For the DCFC program, would EV drivers be able to use credit cards as a minimum open payment option?

   Yes. EV drivers will be able to use credit cards at the DC Fast Chargers owned and operated by DEC and DEP.

4. In general, what do you see as the advantages of this "own and operate" model for Duke in building out these publicly-accessible charging infrastructure, compared to other potential types of market development models (e.g., make-ready plus a rebate where the customer purchases and operates, some type of "partnership" model, etc.)

An "own and operate" model allows DEC and DEP to ensure that the chargers deployed using ratepayer funds are used and useful for the full life of the assets. Rebate programs for public charging infrastructure create stranded asset risk when the utility has no ability to ensure that the chargers remain operable and in good condition over time. Furthermore, this model allows the utility to place stations optimally where there is grid capacity to absorb the load. Lastly, this model also allows the utility to place DCFC where they are most needed – along highway corridors where private operators may not be interested in siting them because utilization will be lower, but where they are nonetheless critically necessary to support broader EV adoption.

5. How will you perform your locational analysis for this DCFC infrastructure, and what sort of data or market surveys will you rely on to achieve this?

   Selection criteria for target sites will be based on the current availability of charging with the goal of installing chargers along highway corridors where there is currently limited access to charging and evenly spread across the state in support of achieving a truly foundational network. Individual sites must be accessible 24 hours per day, 7 days per week and offer or be located within easy walking distance to restrooms and food options.

6. Will you keep the Commission and ORS informed in the process of locating and building out this DCFC regarding your progress in achieving these goals?

   Yes. DEC and DEP have proposed reporting to the Commission on an annual basis as well as providing a final report within 180 days of the conclusion of the Pilots. The Companies are willing to provide more frequent updates if requested by the Commission and/or ORS.

7. Regarding the RFP, will you use a similar process to that which you used in the Florida program for DEF? Describe briefly how you intend to structure the RFP and how you intend to work with vendors and contractors.

   Yes. The structure of the RFP will be like the one used in Florida, which follows standard Duke Energy procurement policy. Duke Energy procurement policy may be found at https://www.duke-energy.com/partner-with-us/suppliers

8. Commissions and regulators in other jurisdictions have mentioned concerns about "technological obsolescence" or potential stranded assets in an own-and-operate model by the utility, in this dynamic field of EV technologies and especially EVSE (equipment) vendors. How do you intend to address these issues?

   The "own and operate" model is least exposed to technological obsolescence because the utility can replace equipment in the future when private host sites will likely not be willing to. As electric utilities, DEC and DEP have the experience of monitoring electrical equipment and dispatching resources to ensure any issues or problems are quickly resolved. Whereas, site hosts such as supermarkets, convenience stores, or retail shops may not have the resources and experience needed to ensure that uptime, or the desire to ensure that stations remain current and operable.

9. Specifically, requiring the vendors to adopt open protocols – for such things as the communications protocol from the network operator to the charging station, or other areas of the network – may be an option to reduce this risk. Do you plan to require the vendors to use OCPP (Open Charge Point Protocol), and Open ADR (an open protocol among national vendors for DR providers), during the RFP process?

Yes, all hardware vendors must provide proof of compliance with OCPP as well as OpenADR capabilities.

10. Refer to pages 12-13 of the DEP Application & pages 13-14 of the DEC Application. The Company proposes that EV drivers will pay a "market rate" for charging an EV at Company-owned direct current fast charging stations.

    a. Is the Company willing to limit the "market rate" price at Company-owned DCFC so that the total cost per charging session is no more than roughly the cost of gasoline providing equivalent mileage?

       Not at this time. The Companies are open to discussing the possibility in the future, but presently does not see this as appropriate or necessary for these limited Pilots.

11. If Electric Vehicle Supply Equipment (ESVE) is installed before the Program officially begins, will the program provide incentives retroactively?

    DEC and DEP are not proposing incentives for the DCFC segment.

12. Exhibit D in DEP's and Exhibit E in DEC's filing states that all ESVE must remain on-site for 36 months. Greenlink recently received a grant from the Federal Transit Administration in the mount of $11 million to build a new maintenance facility. How would this apply if that facility opens during the term of the pilot?

    The question is unclear. Any stations installed by Greenlink would be eligible for the rebate provided they meet the criteria listed in Exhibit E of the Application.

13. Duke Energy proposes to align its utility-owned DC fast charger (DCFC) pricing to drivers with the average market pricing. **Duke Energy is the only entity currently permitted to charge for charging services by kWh.** In contrast, third party charging providers charge drivers using some other metric, such as time, a flat fee for session, or a combination of charges.

    a. Under the proposal, how would Duke Energy reconcile different metrics of charging drivers fees for DCFC services with those limited metrics third parties currently use? (Ex. Deriving an average kWh charge based on third parties using fees based in per minute or session).

       The average $/kWh for stations that charge by time will be converted using an average dwell time of 30 minutes and average charge of 25kWh.

    b. Would Duke Energy only factor in DC fast charging that involves a fee when determining average market pricing? What about stations that do not charge a fee?

       When determining the market rate for DC Fast Charging fees, DEC and DEP will only factor in stations which charge a fee.

    c. Can Duke Energy provide such a pricing comparison analysis today as an example based on existing DCFC?

       At last calculation, the current statewide average price was $0.23/kWh.

14. What factors will DEC and DEP take into account in siting locations for its DC Fast Charging Stations?

    Selection criteria for target sites will be based on the current availability of charging, with the goal of installing chargers along highway corridors where there is currently no access to charging and evenly spread across the state in support of achieving a truly foundational network.

Individual sites must be accessible 24 hours per day, 7 days per week and offer or be located within easy walking distance to restrooms and food options.

15. How will DEC and DEP select which contractor to use to install, operate, and maintain the DC Fast Charging Stations?

    Duke Energy will follow its standard procurement policies, which may be found at https://www.duke-energy.com/partner-with-us/suppliers .

16. Has DEC and DEP assessed the overall market demand for DC Fast Charging Stations? If so, provide any assessment.

    DEC and DEP used the EVI-Pro Lite tool developed by the Department of Energy to determine the demand for DCFC given current forecasts of EV market growth through 2025. The results showed a need of 1,000 DCFC to support the 2025 forecasts. There are currently only 40 public, open-standard DCFC in the state of South Carolina.

17. What are the difference types of siting locations that DEC and DEP have identified as having significant market demand for DC Fast Charging Stations? Which ones does DEC and DEP consider to be appropriate for utility-funded infrastructure, for primarily privately-funded infrastructure, and for partnerships between utility and private funding?

    The current lack of fast charging infrastructure is a significant barrier to mass-market adoption of electric vehicles and can be attributed to the high capital investment needed to deploy a DC Fast Charger (DCFC) as well as high ongoing costs of operation and maintenance. There is no commercial business case for installation of public DCFC based on a "fueling station" business model at this time, especially on the highway corridors where they are most needed but utilization is lower. The DCFC segment of the ET Pilots was proposed to install a foundational level of DCFC throughout the state of South Carolina to facilitate cross-state travel in an electric vehicle. The Companies have proposed owning and operating the DCFC chargers in order to protect against stranded assets and ensure the chargers are used, useful, and reliable throughout the full life of the asset. As shown in previous rebate programs, some site hosts do not adequately maintain stations.

    Installation of DCFC requires participation from a willing site host, therefore it is not possible to determine in advance exactly where each DCFC will be located. Selection criteria for target sites will be based on the current availability of charging, with the goal of installing chargers along highway corridors where there is currently limited access to charging and evenly spread across the state in support of achieving a truly foundational network. Individual sites must be accessible 24 hours per day, 7 days per week and offer or be located within easy walking distance to restrooms and food options. The few DC Fast Chargers that are currently deployed are mostly clustered in metropolitan areas. They do not effectively serve as a link for long distance travel. South Carolina finds itself in a position where it needs infrastructure to create demand for private sector investment while the private sector needs demand before making the necessary investment.

18. Did DEC and DEP consider offering DC Fast Charging as a make-ready program, meaning that DEC and DEP would own and operate the equipment up to the charging station? If not, how would DEC and DEP consider structuring partnerships between utility and private funding to serve markets that are not appropriate for the 100% utility-funded infrastructure?

DEC and DEP have considered the make-ready model and did not find it appropriate for these Pilots. An "Own and operate" model allows DEC and DEP to ensure that the chargers deployed remain used and useful for the full life of the assets. Make-ready and rebate programs for public charging infrastructure create stranded asset risk when the utility has no ability to ensure that the chargers remain operable and in good condition over time. Furthermore, this model allows the utility to place stations optimally where there is grid capacity to absorb the load with minimal upgrades. Lastly, this model also allows the utility to place DCFC where they are most needed – along highway corridors where private operators may not be interested in siting them because utilization will be lower, but where they are nonetheless critically necessary to support broad EV adoption.

19. How will the DC Fast Charging Stations be sited in relation to other fast chargers, such as those being installed by Electrify America or other third parties?

    Selection criteria for target sites will be based on the current availability of charging (i.e. Electrify America), with the goal of installing chargers along highway corridors where there is currently limited access to charging and evenly spread across the state in support of achieving a truly foundational network.

20. Is DEC and DEP considering siting DC Fast Chargers in areas with broad public access?

    Yes. DEC and DEP intend to require selected host sites to provide 24/7 public access to DCFC.

21. What other factors are being considered (such as accessibility, proximity to high-traffic routes and rural routes – that may spur adoption)?

    Selection criteria for target sites will be based on the current availability of charging, with the goal of installing chargers along highway corridors where there is currently no access to charging and evenly spread across the state in support of achieving a truly foundational network. Individual sites must be accessible 24 hours per day, 7 days per week and offer or be located within easy walking distance to restrooms and food options.

22. Would DEC and DEP consider the lessons learned from the DC Fast Charging Program to be applicable to Level 2 or other lower cost charging stations? If not, why not? If so, please discuss how the program is designed to inform the design of programs to build out lower cost public charging stations.

    DCFC is a distinct segment and use case for EV charging. The data and lessons learned likely will not apply to L2 stations other than very high-level considerations.

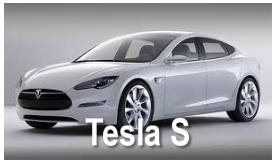
Duke Energy Carolinas: Charge|Carolinas Program Final Update – DOCKET NO. 2011-114-E

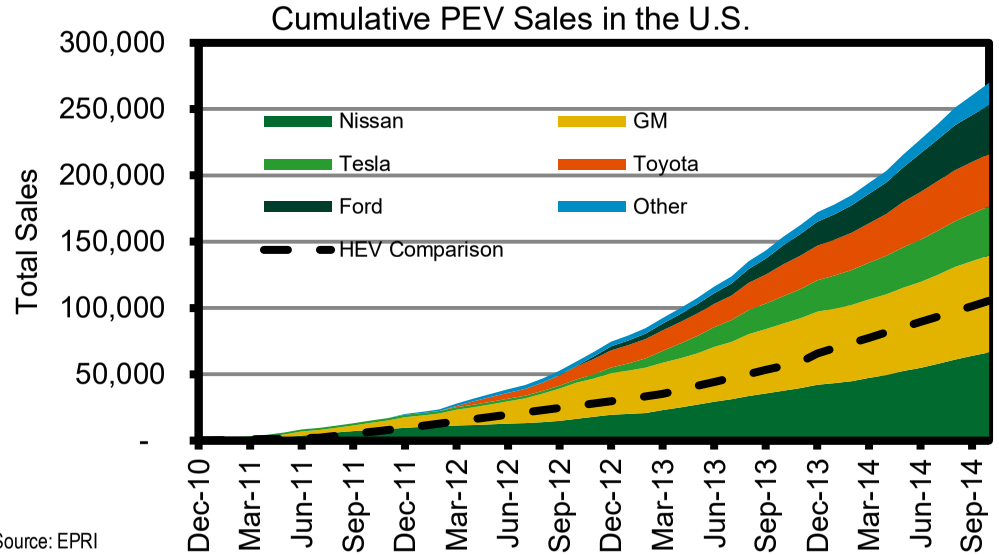
January 2015

DUKE ENERGY®

Plug-in Electric Vehicle Market Update

- The market for Plug In Electric Vehicles (PEV) continues to grow as more models become available
- Through October of 2014, over 269,000 PEVs have been sold in the USA and over 940 in SC
- PEV adoption is occurring at more than twice the rate of traditional hybrids when they were first released
- Approximately 20 models of PEV are currently available in the USA





Source: EPRI

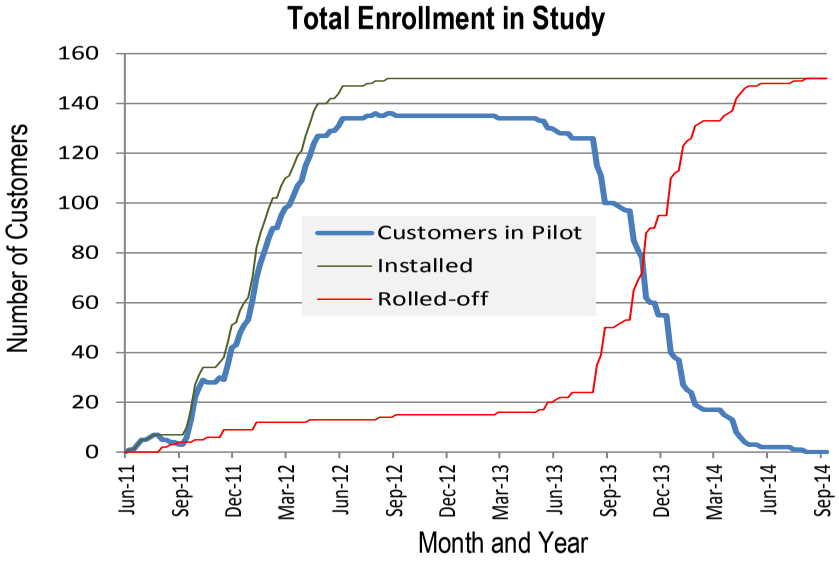
Study Overview

- The Charge Carolinas Study ("Study") provided charging stations to 150 residential customers who bought or leased a plug-in electric vehicle in the Duke Energy Carolinas (the "Company") service area
- Participants were provided a charging station and up to $1,000 of installation fees paid by the Company in exchange for collecting data about their charging behaviors
- The Company provided the charging stations and necessary monitoring equipment and coordinated the end-to-end installation, service and support
- Each participant was enrolled for a 24-month period
- The final customer rolled off in September 2014
- Participants had the option to purchase the charging stations for $250 at the conclusion of their 24-month contract period

Residential Charging Station used in the Study

Study Milestones

- Jan 2011: Filing Submitted in North Carolina
- March 2011: Filing Submitted in South Carolina
- March 2011: Approved in North Carolina
- May 2011: Allowable Ex-Parte presentation to Public Service Commission of South Carolina
- June 2011: Approved in South Carolina
- June 2011: First customer installation in North Carolina
- February 2012: 100th customer installed
- September 2012: 150th customer installed
- June 2013: First customer completes two-year Study enrollment
- September 2014: Last customer completes two-year Study enrollment



Study Roll off Status	# Participants
Removed from Study before 2-year contract complete (Charger removed by the Company)	6
Removed from Study before 2-year contract complete (Charger purchased by participant)	3
Completed 2-year contract (Charger removed by the Company)	8
Completed 2-year contract (Charger purchased by participant)	133
Total Participants	**150**

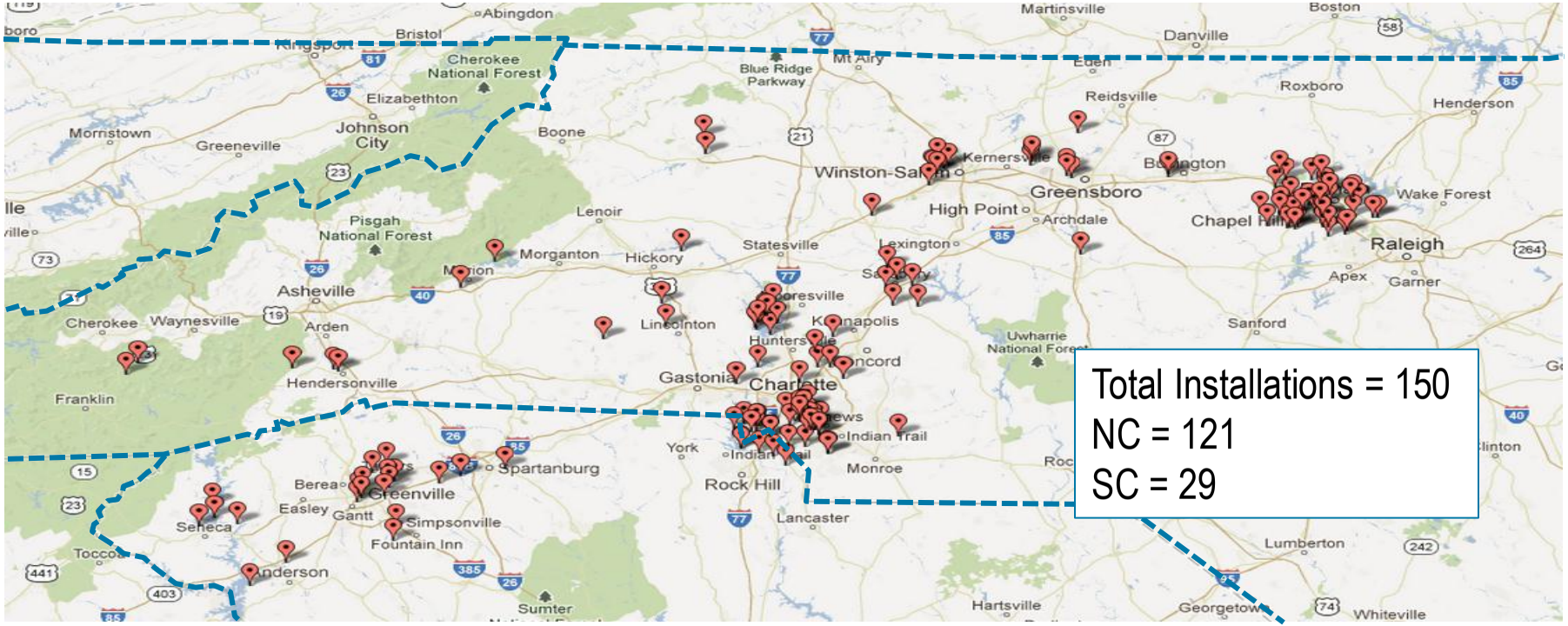
Study Cost Summary

	Budget Estimates in Filing	Final Costs
Project Management	$187,200	$236,747
Charger, Installation, Un-installation	$422,000	$369,065
Customer Acquisition, enrollment, outreach and call center	$230,000	$112,593
Database set-up, IT Support	$72,800	$116,983
Misc. Expenses (including communication fees, data analysis)	$315,120	$216,881
Total	**$1,227,120**	**$1,052,269**
DoE Credit		$166k
Grand Total Company Cost		**$886,269**

Notes:

- Original project budget of $1.227 million
- Project originally funded through base rates – decision to partially fund using DoE grant funds in 2012
- Company received DoE credit of $166k

Study Participants/Installations



Study Benefits

1. **Better understand customer charging behavior, including charge frequency, duration, load and peak.**

Outcome: Charging data and patterns were monitored for all program participants during the period of demonstration. Significant knowledge has been gained on co-incident peak, demand by time, and day of the week. See final page for summary of charging behavior findings.

2. **Determine the impact on demand, transformers, cabling, and other infrastructure.**

Outcome: The Study allowed for more accurate and in-depth analysis regarding how PEV charging may impact various aspects of the grid moving forward. Real world monitoring of the PEVs involved in the Study found that natural diversification helped to keep average load at the substation level to a moderate range of between 0.6-0.7 kW per vehicle. In addition, the peak of vehicle charging was offset several hours from the typical utility system peak and thus overlap coincident peak was only partial. Detailed analysis of transformer assessments in the field is ongoing and it appears that some units were upgraded. However, it is difficult to ascertain from the data if those upgrades were necessary due to the PEV load addition or other unrelated load changes in the homes and new equipment sizing guidelines. PEVs may become a more significant factor in transformer assessments in the future as vehicle adoption continues to grow, “clustering” becomes more common in neighborhoods, and the amount of power that vehicles can request increases.

Study Benefits (cont.)

3. Understand the technical capabilities and abilities of the intelligent charging stations.

Outcome: The Study evaluated and used numerous station capabilities including remote data collection, remote reboot, remote start/stop of charging and messaging on charging stations. Overall, the intelligent charging stations provided informative and helpful data about customer charging behaviors. The charging stations generally performed very well, with only 16 troubleshooting calls. Charging stations for 3 customers were replaced by request for non-safety reasons (e.g. "humming" sound).

4. Determine whether Duke Energy Carolinas should influence charging behavior.

Outcome: This Study was instrumental in helping the Company understand the baseline charging patterns in which there were no external influencing factors (e.g. a required TOU rate). At this time, the Company believes that electric vehicle charging may be integrated into the system with minimal impact. It is also our goal to support our customers and meet their transportation fuel needs while ensuring continued grid reliability and cost effectiveness. As such, the Company will continue to actively research and assess potential programs to provide the tools to intelligently, safely, and reliably manage charging and encourage customers to avoid charging during peak periods on the grid.

Study Learnings – Customer Interactions

- Customer Interactions
  - Installation of charging stations was more work intensive than originally anticipated
    - Study participants had an average of 8 interactions from enrolling to completing installation
    - Interactions included schedule assessments, installation and inspections
    - Significant effort was required to track and manage the process due to the amount of interactions and paperwork
  - The process from the customer submitting his or her interest in the Study on the Website to the completed installation took an average of 11 weeks
    - The main variables were the necessity of an electrical permit per county/city regulations and possession of a valid business license by the contractor in the county of installation

- Areas of Improvement
  - Simplify the contract and installation process
  - Reduce the amount of paper work required
  - Make charging data more accessible for the customer
  - Streamline the inspection process

Study Learnings – Customer Installation Survey Feedback

- Duke Energy conducted a survey to solicit feedback on the Study after installations were completed
  - When asked to rate their overall experience with the enrollment and installation:
    - 73% responded that the overall experience was excellent
    - 22% responded that the overall experience was good
    - 4% responded that the overall experience was average
    - 1% responded that the overall experience was fair
  - Feedback on our contractors was excellent
    - 100% of the respondents said the installer was on time and professional
    - 99% of the respondents felt the electrical contractor was able to answer all of their questions
    - 98% said the electrical contractor left the work area in acceptable condition upon completion of the work

Study Learnings – End of Program Survey Feedback

- Duke Energy conducted a survey to solicit participant feedback upon completion of the Study
  - When asked to rate their experience with the charging station:
    - 96% responded that the charging station was reliable
    - 97% responded that the charging station was easy to use
    - 99% responded that the charging station was installed in a convenient location
  - Feedback on any issues or problems experienced with the charging station:
    - 88% of the respondents said they did NOT experience an issue or problem during the Study
    - 93% of the those respondents who indicated an issue had it resolved to their satisfaction
  - Feedback on participating in any future program/offering based on this Study experience:
    - 97% of the respondents indicated they would be interested in participating in a future program/offering

Study Learnings – Summary of Residential Usage Analysis

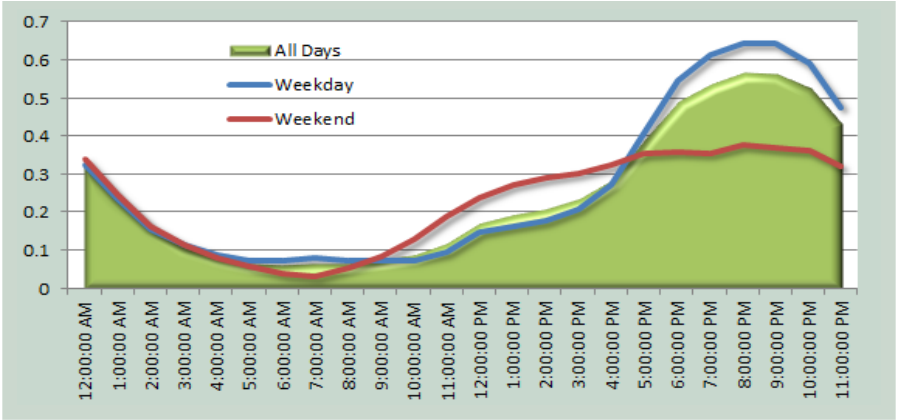
Residential Driver Statistics

- Average energy use per charging session was 7.1 kWh
- Average duration between plug-in/plug-out events was 11 hours
- Nearly half (46%) were fully charged within 2 hours
- Peak diversified load was 0.6-0.7 kW per vehicle
- Highest weekday energy usage was between 8pm and 9pm

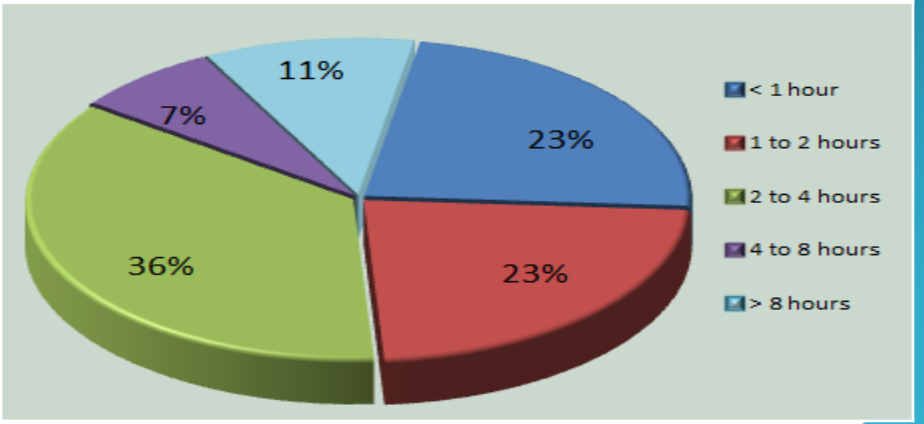
Average of 7.1 kWh Per Charging Session

Equivalent of ~ 24 Miles Driven (at 3.3 mi/kWh)

Daily Load Profiles



Length of Time Charging – 82% of charging time lasts 4 hours or less



South Carolina Electric Transportation Pilot

January 2019

South Carolina Electric Transportation Pilot Programs

Background

- Market development has advanced significantly since original DEC/DEP Pilots.
- Timing is right to introduce new utility programs to study and support EV/ET adoption.

Program Goals

Programs designed for residential and nonresidential customers interested in exploring the benefits that a greater penetration of EVs and ET infrastructure may unlock while seeking opportunities to help offset the costs of procuring EVs and ET equipment:

- Install a foundational level of fast charging infrastructure across DEC & DEP service territories in South Carolina.
- Study the effects of charging multiple types of electric vehicles.
- Develop procedures to ensure cost-effective integration of vehicle charging by actively managing charging loads.
- Study how best to support public transit electrification and associated cost savings in South Carolina.
- Study how to ensure electrification projects benefit all customers, including those who do not own electric vehicles.

South Carolina Electric Transportation Pilot Programs
Why a Pilot?

- Not yet ready for full deployment - there are factual questions that need to be answered through data gathering which will be made possible by the Pilots.
- Need a better understanding of grid impacts of serving EV charging equipment, customer charging behavior and the viability of utility-managed charging methods, chance to develop procedures to ensure new load from EV charging is integrated in a cost-effective manner.
- Limited cost exposure for customers and the Companies.
- Results of the Pilots can facilitate broader policy conversations at the right time.

South Carolina Electric Transportation Pilot Programs – Program Overview

Segments	DEC	DEP	Goal
Residential EV Charging	400		Establish customer charging behavior and utility managed charging potential.
DC Fast Charge Stations	20	10	Provide a foundational network of DC Fast Charging throughout South Carolina.
Electric School Bus	20	10	Demonstrate electric school bus capabilities for load balancing and backup power applications.
Electric Transit Bus	20	10	Establish transit bus charging behavior and utility managed charging potential.

Segment	Structure	Amount	Program Features/Eligibility
Residential EV Charging	Rebate	• $500 Upfront • $500 over 3 yrs of quarterly payments	• Customer must own, lease or otherwise operate on a regular basis an EV and install a communication-enabled EVSE. • Customer may choose from a list of eligible EVSE with appropriate capabilities. • 1st year will gather baseline charging behavior and utilization characteristics. • 2nd & 3rd years will test utility-managed charging programs.
DC Fast Charge Stations	Install, own and operate	"Fast Charging Fee" charged to end use customer.	• Provide a foundational network of EV Fast Charging across South Carolina without preference to DEC/DEP electric service customers. • DE will install, own and operate every installation. • Sites may be located on 3rd party host property, or company property open to the public.
Electric School Bus	Rebate	• Up to $125,000	• Rebate to SCDE to procure electric school buses and associated charging infrastructure. • 1st year will gather baseline charging behavior and utilization characteristics. • 2nd year will test utility-managed charging potential and V2G/V2B capabilities.
Electric Transit Bus	Rebate	• Up to $55,000	• DE to provide a rebate to procure electric transit buses and associated charging infrastructure. • 1st year will gather baseline charging behavior and utilization characteristics. • 2nd year will test utility-managed charging capabilities.

South Carolina Electric Transportation Pilot Programs – Estimated Costs Over Three Years

Program	DEC	DEP
Residential EV Charging Program	$0.40M	
EV School Bus Program	$2.54M	$1.27M
EV Transit Bus Program	$1.14M	$0.57M
DC Fast Charging Program	$2.61M	$1.30M
Education/Outreach and Ongoing O&M	$0.42M	$0.18M
Total	$7.1	$3.3

DC Fast Charge Segment – Fast Charging Fee Calculation

- In order to recover the cost of delivered energy and a portion of the capital costs from end users of the DE Pilot DCFC installations, a Fast Charge Fee will be charged to all EV drivers using DCFC installations.
- To ensure DE Pilot DCFC installations do not charge an artificially low fee, the Fast Charge Fee will be based on the average price charged by currently available public DCFC in South Carolina.
- The Fast Charge Fee will be calculated and changed no more than once per quarter in order to provide a stable price signal to Pilot DCFC customers.
- The Fast Charge Fee will calculated as follows:

  Every quarter, DE will sample charging fees from the DOE Alternative Fuel Data Center (https://www.afdc.energy.gov/stations/).

  DE will calculate the average $/kWh equivalent charge of all publicly available stations in SC which charge for EV charging.

  DE will update pricing no more than once per quarter to match the statewide average DCFC fee.

- Any net revenue collected in excess of the operational cost of the DCFC locations will be applied to the capital cost or regulatory asset accrued.

South Carolina Electric Transportation Pilot Programs – Reporting

- First Year Report – Create baseline
  - Number of rebates issued per program
  - Number of charging stations deployed
  - Amount/when energy is used
  - Average load curve for each programs
- Second & Third Year Reports
  - Include load control information for Residential EV Charging Program
  - Total installation costs per station, rates charged and utilization rates for DCFC Programs
- Annual and final reports will be filed with the Commission and available to the public
  - Education and outreach initiatives detailed and tracked
  - Estimate of emissions reductions associated with the Pilots

SC ET Pilot Stakeholder Working Group Participant Questions & Answers

January 2019

Program Design

General Program Design

Priority Segments

- Residential: Gather baseline data and test load management.
- School Bus: Leverage VW Settlement funding, gather data, demonstrate V2G abilities, reduce operating costs.
- Transit Bus: Leverage grant funding, gather data, reduce operating costs.
- DCFC: Install a foundational network available to all customers; eliminate range anxiety, facilitate cross-state travel.

Programmatic Requirements

- Gather data.
- Test load control technical and operational abilities.
- Protect against stranded assets and technological obsolescence.
- Provide customer choice.
- Support development of a competitive market.

Incentive Levels

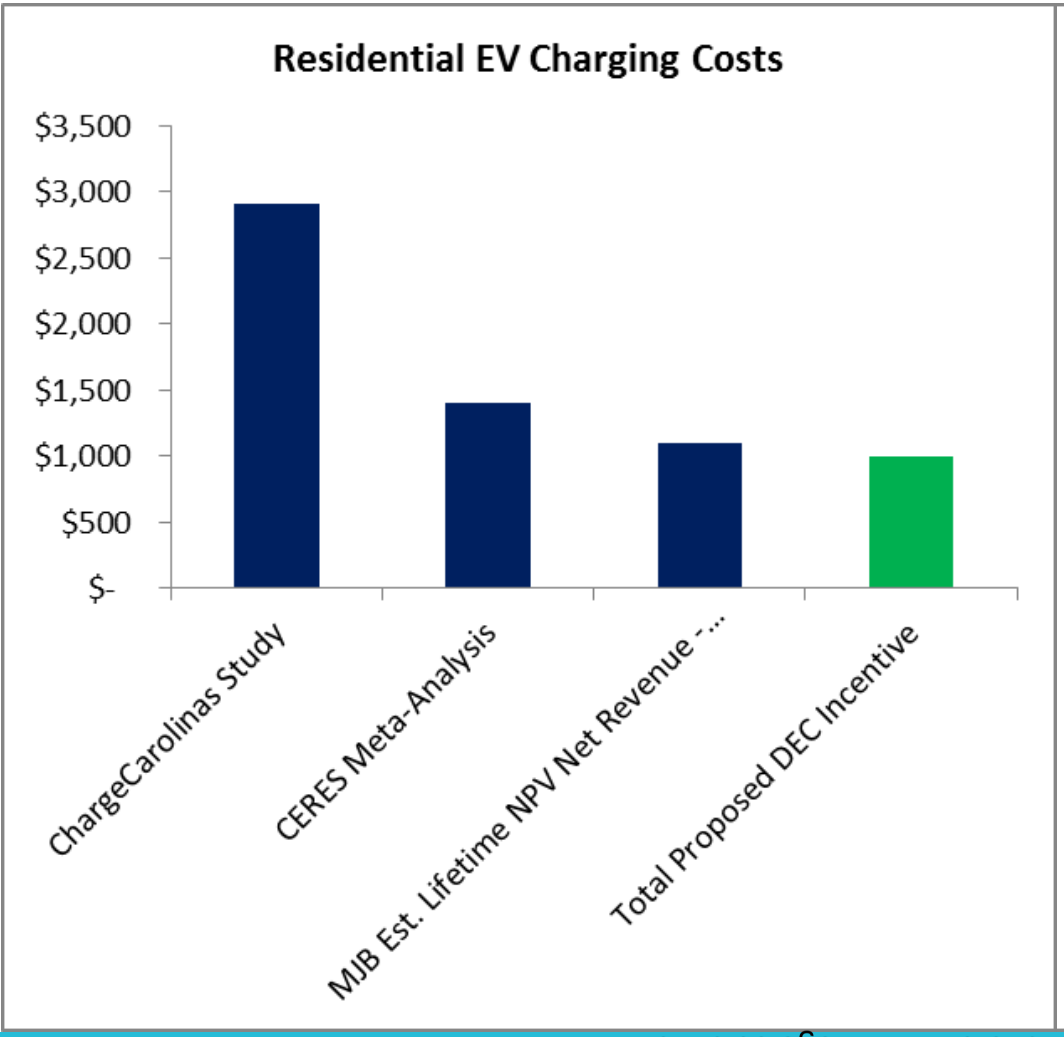
- Offset 50-100% of EVSE procurement and installation costs.
- Provide sufficient incentives to create incremental opportunities within existing grant programs.
- Align costs with initial estimated value to utility system.

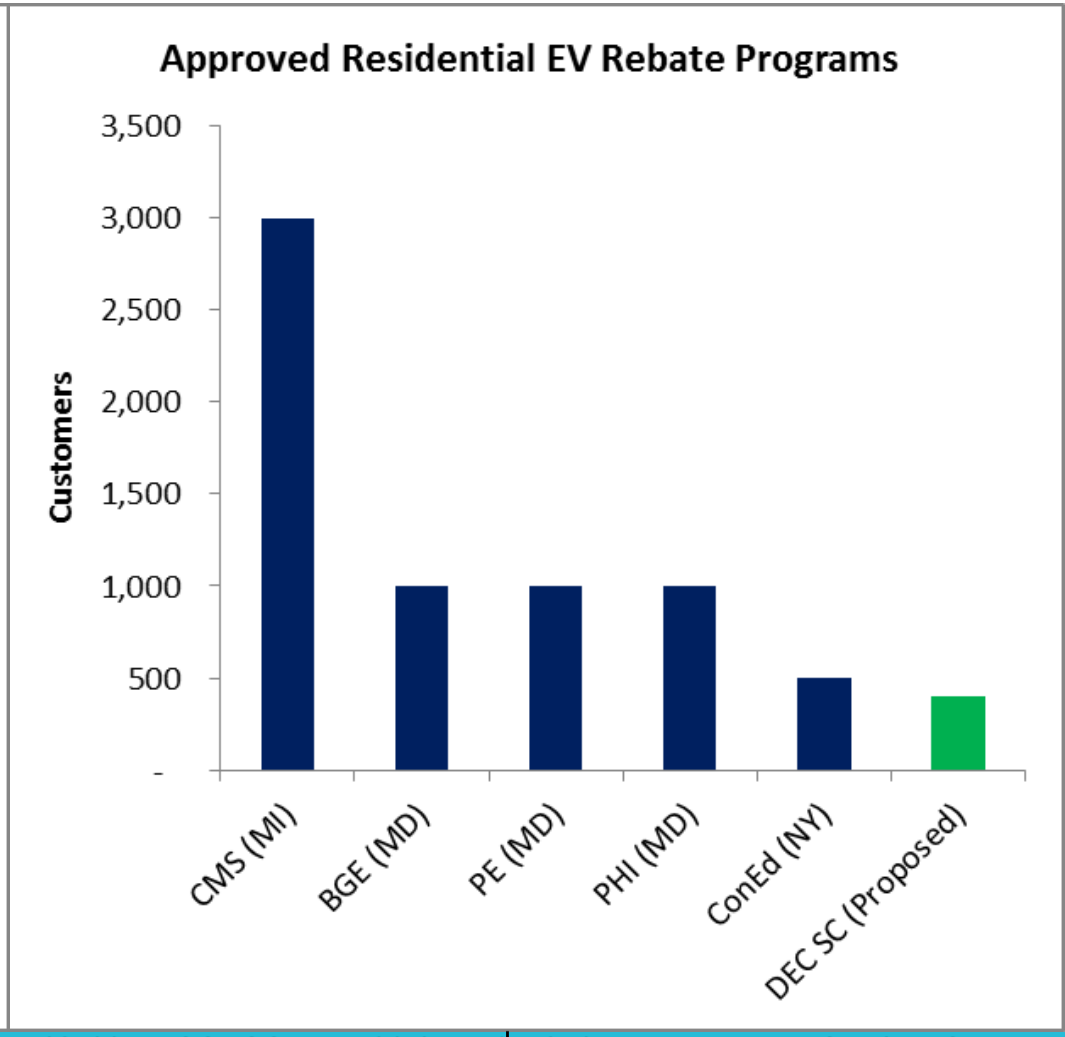
Participant Levels

- Control program costs by limiting participation.
- Create large enough programs to gather significant data.
- Facilitate significant growth in the SC EV market.

Residential EV Charging Program:

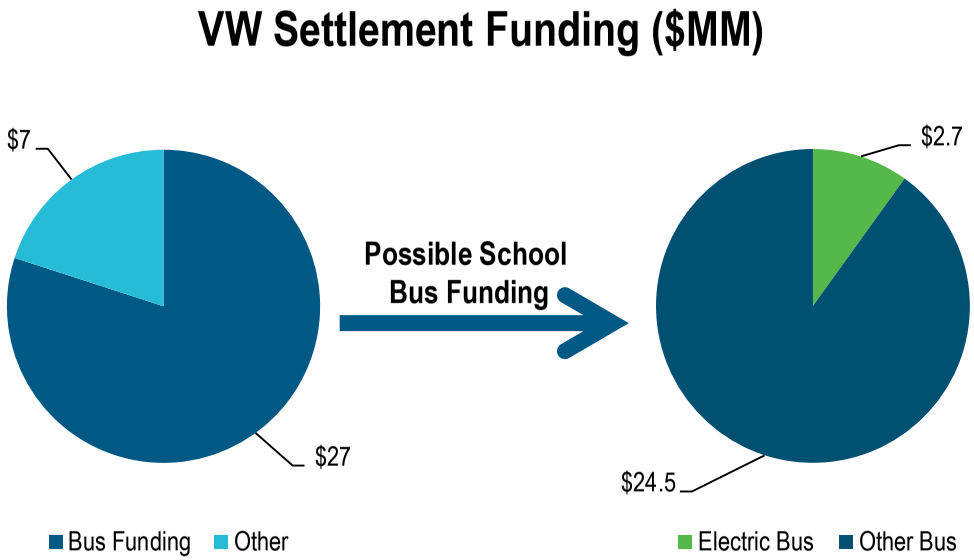
- Incentive and participant levels were developed in line with comparable programs and available data:

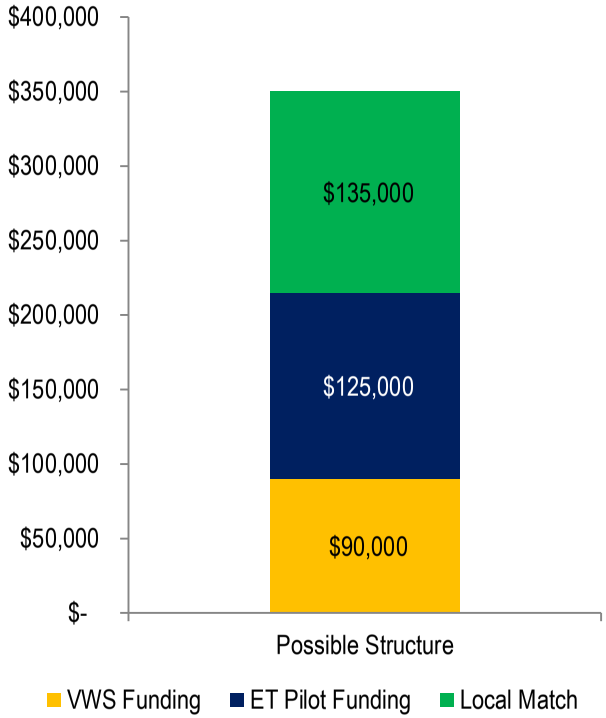




EV School Bus Program:

- 12/6/2018 - SC DOI published the final Beneficiary Mitigation Plan:
  - 80-100% of EMT to fund Class 4-8 School, Shuttle, and Transit Buses
  - $27M of funding available
  - Replacement of school buses is a priority for South Carolina
  - Goal of ET Pilot is to leverage VWS funding to increase emissions reductions without additional spend.





DCFC Program Design

- Program goal: install a foundational level of DCFC infrastructure across the Companies' SC service territory.
- Current SC DCFC: 20 charging locations with 43 charging outlets.

- Fast Charge Fee: Last calculated at $0.23/kWh
- DEC/DEP will secure site host locations with 24/7 public access located within close proximity to highway corridors and walking distance to amenities such as restrooms and food options.
- DEC/DEP will account for existing and planned installations by other DCFC operators such as Electrify America and Evgo to install locations that expand DCFC access rather than duplicating.
- The Companies have considered other models for DCFC deployment such as rebates and "make ready." These models do not sufficiently protect ratepayers from the risk of stranded assets in the public-access DCFC segment. Past rebate programs for public EVSE installation have resulted in ~20% of chargers offline within 5yrs; early DCFC deployments have led to many unreliable or non-functional DCFC across the DE footprint.

Residential EV Charging Program

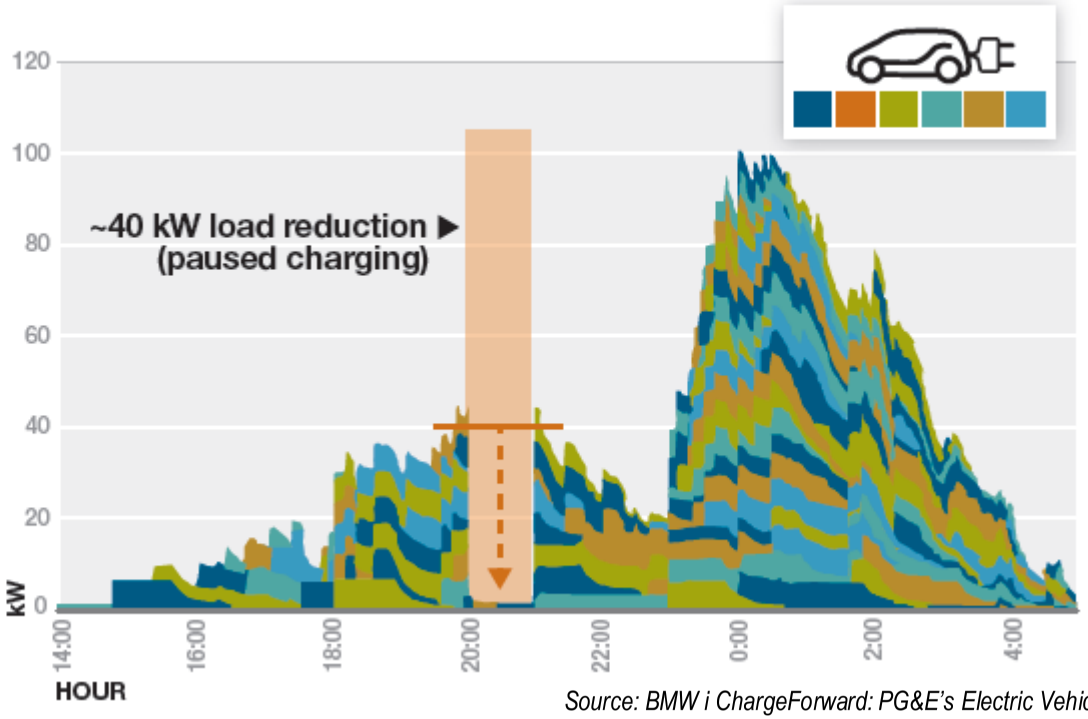
- Year 1: Baseline data gathering.
- Year 2&3: Experimental load control phase.

  DEC will conduct a limited number of load control events within pre-defined time periods communicated to customers in advance.

  Customers will have the opportunity to opt-out of up to 3 events per month.

FIGURE 25 **Examples of Demand Response Event, Vehicle Pool**

The figure displays the performance of the vehicle pool (Residential BMW i3) customers during a demand response event on 10/21/2015 from 8:00–9:00 PM. The colored bands indicate individual vehicles charging. The orange column indicates the demand response event duration when charging was delayed for each customer charging at that time.



Source: BMW i ChargeForward: PG&E's Electric Vehicle Smart Charging Pilot

Rates and Related Questions

Residential EV Charging Program

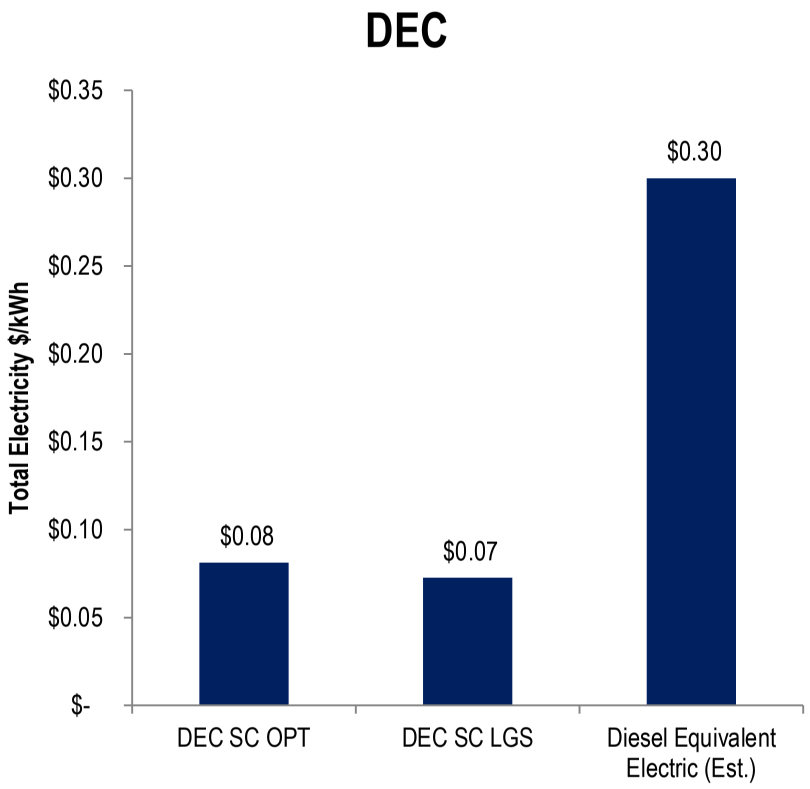
- Purpose: Determine current EV charging behavior, average load curves, and feasibility, value, and best practices for EV charging load control.
- Time of use (TOU) rates will influence customer behavior, resulting in an inaccurate baseline.
- Testing of feasibility and value of EV charging load control will be similarly impacted by customer behavior if affected by TOU rates.
- Standard DEC/DEP residential rates are already less than half the cost of gasoline.
- TOU rates will reduce net revenue from EV charging, potentially reducing ratepayer benefits of EV charging programs.

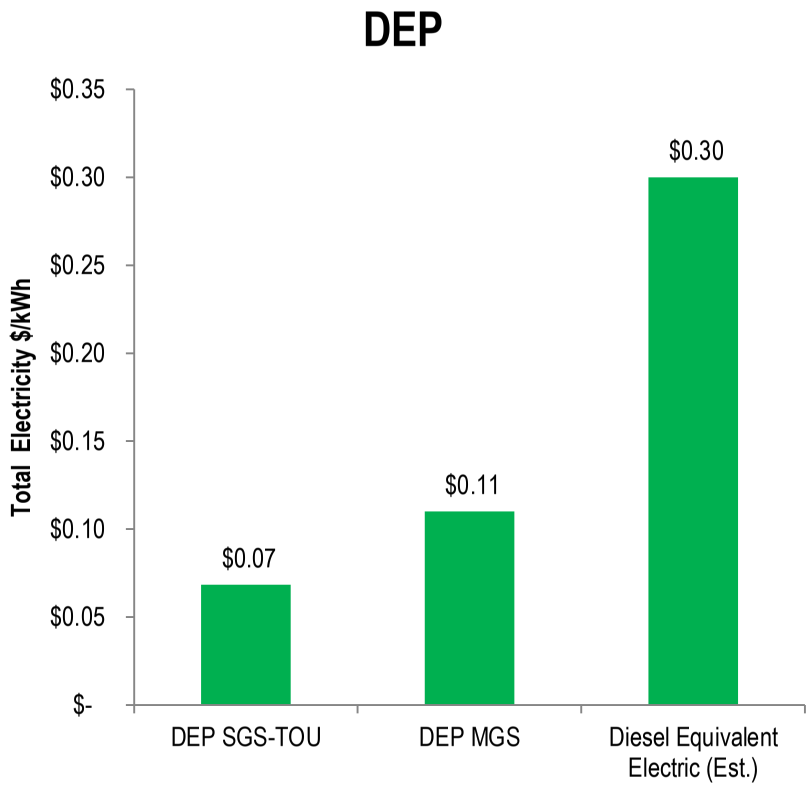
DCFC Program:

- TOU and/or load control are not suited to DCFC due to the fact that maximum charging rates must be delivered at all times to provide a seamless and consistent user experience.

EV School and Transit Bus Charging Programs

- Commercial TOU rates are already available to Transit and School Bus customers.
- Recommendations with respect to rates will be developed as part of the final report.





Assumptions	
30min Peak Charging Demand (kW)	50
kWh/Yr	4,167
Off-Peak Charging Time	10p-6a
Avg Diesel Price ($/gal)	$ 3.00

Education and Outreach

Draft Education and Outreach Plan

- Research has shown awareness of EVs as a current barrier to adoption.
- Similar to energy efficiency programs, DEC/DEP have proposed Education and Outreach activities to raise awareness of the ET Pilot Programs in order to maximize participation and ensure that funded infrastructure is well-utilized.

	DEC	DEP
Events and Outreach	$84,000	$36,000
Advertising, Brand, and Media	$210,000	$90,000
Collateral and Promotional Items	$21000	$9,000
Auto Dealers and Electricians	$105,000	$45,000
Total	$420,000	$180,000

State Electrification Policy Topics Identified

During the working group discussion, several topics were raised that require broader electrification policy deliberation. The topics listed below have been identified as potential state-wide electrification policy issues and will be addressed by a broader stakeholder policy discussion to be convened by the State Energy Office in Q2 of 2019.

- IRP – Utility Plant v. Electrification
- Time Constraints/Lack of overall state electrification policy
- Data mining from statewide deployments
- Payment Methods at public chargers – Convenience; Security; Connectivity
- Allow other parties to charge by $ kW/hour
- VW Settlement Funds – Future funding
- On Bill Financing for Electrification
- Utility Role in supporting electrification of state fleets, ie. School buses
- Customer choice of hardware and networks in electrification infrastructure

Category	Program	Concerns	Clarification	Possible Considerations (These topics drove the "Consensus Modifications" above. The Group only reached consensus on 3 items from the below list, as highlighted)
Funding/ Incentives	School Bus/Transit Bus Pilots	• Uncertainty of VW settlement funding and potential shortfall in necessary funding based on current costs • Concern that current incentive level may be inadequate to drive purchase decisions - Current incentive is too low • Equity issue – incentives may only be used by investors who can afford the expense • Sustainability – What's next after the VW funds? VW funds is one time event and funding levels are not set	• Does transit charging station rebate incent bus electrification? • Meet goals of overall program? • Clarification provided during discussion from Department of Insurance (Subject to verification from Dept. of Insurance) ○ $34 Mill in Benefit Mitigation Plan ○ Minimum of 80% for buses ○ Must use funds within 10 years ○ Currently in Year 2 of Plan ○ Up to $10 Mill allocated for spending in 2019 ○ Application process for bus program is being created, rollout planned prior to end of 2019 • School bus program provides $125,000 to cover the bus and charging equipment combined • Example review of costs/funding needs ○ Cost of new electric school bus is $350,000 ○ Cost of new diesel school bus is $90,000 ○ VW Settlement will cover the cost of the new diesel school bus ○ Leaves $260,000 to be covered by customer, plus the cost of charging equipment	• The bus pilot programs should cover the incremental costs ▪ Utility should identify and consider funding sources for local matching to increase participation and cover gap in funding of equipment ▪ Increase school bus incentive ▪ Proposal for alternative funding – recommend the utility consider on bill financing ○ Ex. Based on prior funding example, the gap is $260,000 which could be capped in the pilot program ○ Utility could cover the initial expense of this gap and the customer would pay that gap back over time through utility financing on the bill in monthly payments ○ Reduces the cost of the pilot to rate payers

Funding/ Incentives	School Bus/Transit Bus Pilots	• Transit program only covers charging equipment at $55,000 per charging station		• Clarify in the Transit Bus program tariff that the incentive is for the charging infrastructure only
Goals/ Metrics	Overall Program	• Different vehicles across segments have different battery sizes	• Will data be collected on the charging behavior of different residential vehicles?	• Determine how to accommodate the following variances in data in utility reporting: • impact of various battery sizes and different types of vehicles
Goals/ Metrics	Overall Program	• Unclear data	• Will geographic data/location of charges be reflected in data? Urban v. Rural, etc. • What data will be collected from the various programs specifically related to V2G capabilities?	•
Goals/ Metrics	Overall Program	• Emissions goals carries a regulatory cost risk. • Utilities are not required to meet reductions in transportation emissions. • Regulated Utility ratepayers would be funding an arbitrary goal.		
Goals/ Metrics	Overall Program	Potential gap in overall goal of establishing charging infrastructure and learning charging behavior • Lack of focus on medium and heavy duty charging ○ Impact to rates or rate impact on adoption or charging behavior • Lack of focus on LMI or MultiFamily dwellings in all programs • Participation rates in LMI market segments		• Modify language of goals to include studying benefits of all ratepayers to include all market segments • Study innovative ways to ensure electrification benefits all ratepayers • Consider expanding program to include multifamily units

Goals/ Metrics	Overall Program	• Missed learning opportunities • EVs currently deployed not eligible for incentives that could provide learnings	• Will be collected from EV owners who do not plan to install a Level 2 Charger? • Will the program be expanded to include those customers?	• Consider gaining efficiencies in the study goals by utilizing data from other users outside of participants in the program such as: ○ Other Municipals in the state who are not direct customer of Duke Energy which have or will be deploying electric buses ○ Residential customers of Duke Energy who already own an electric vehicle and associated charging equipment
Goals/ Metrics	School Bus/Transit Bus Pilots	• Target for the School Bus and Transit Bus programs are very complex	• How can it be simplified?	
Goals/ Metrics	School Bus/Transit Bus Pilots	• Municipals in the state (not just Duke Energy direct customers or not even Duke Energy customers) will be acquiring and deploying buses		• Consider gaining efficiencies by utilizing data from other users outside of participants in the program
Length of Pilot	Overall Program	• Lack of clarity of beginning point for eligible program participants	• When does the 3 year mark begin? • Does an eligible participant have the opportunity to participate for a full three years, or does the pilot have a specific cutoff for benefits/participation?	• Clarify the beginning point of the 3 year pilot for each program
Marketing, Outreach and Education are not reflected in the overall program goals.	Overall Program	• Lack of education is a known market barrier • Concern that there are no goals articulated for education/outreach and therefore no metrics have been established	• No metrics to review success of these efforts and this spend in the pilot. Will this be tracked? How? What is the success criteria?	• Assess participation of the various programs in low to moderate income areas and review the impact of the pilot on participation in those market segments
Marketing, Outreach and Education are	Overall Program	• Concern about lack of outreach to various regional		• Identify and market to the regional transit authorities operating in DEC/DEP territory

not reflected in the overall program goals.		transit authorities in DEP/DEC territory		
Oversight and Reporting	All Programs	• Concern that the 3 year pilot is not long enough to collect data to fully study operational savings to the customers who purchase buses/charging equipment • Pilot is 3 years but includes guarantee of battery replacement costs up to the 12 year life of the battery. • Residential learnings after 3 year pilot	• How will the utility manage these issues past the 3 year pilot time period? • Will data continue to be collected from customers after the 3 year pilot?	• Provide clarification on how the utilities will track and report on investments past the 3 year pilot program
Oversight and Reporting	Overall Program	• Reporting at various stages of the pilot seem limited to specific programs		• Build flexibility into annual reporting for all programs – 1, 2, and 3 year variances – based on progression of pilot as defined and on lessons learned throughout the pilot
Oversight and Reporting	Overall Program	• Publicly available vs. Proprietary data used in reporting	• What data will be made available for review? Ex. Baseline, load curve, energy used, etc.	• Establish a Stakeholder Group to meet annually with Duke Energy to review lessons learned, receive updates on any changes or modifications to the various programs, have an opportunity to ask questions and provide feedback
Oversight and Reporting	School Bus/Transit Bus Pilots	Gaps in reporting • Variable vehicle operations ▪ School buses don't operate all year, but reporting is designed annually		• Determine how to accommodate variances in data in utility reporting such as impact of variable vehicle operation data on reporting (school buses that don't operate during the summer)
Program Size	DCFC Pilot	• Small size of pilot • Concern about unintended consequence of range anxiety		• Consider increasing to bring in line with goal of supporting backbone infrastructure

		if chargers at a location are fully utilized (not available for other customers when needed)		• Consider increasing # of chargers at a location, based on customer/use demand at that location during the 3 year pilot • Potentially increase number of chargers • Potentially increasing the capacity of the chargers
Rates	All Pilots	• Lack of consideration of time of use rates • Concern about impact of charging to customer demand charges		• Review potential for a separate rate tariff for EV Chargers • Consider Including incremental demand charges as part of rate • Compare EV charging behavior/usage to standard time of use rate structures • Review current demand charges for electric services rates ○ impacts to bills ○ impacts to utility revenue
Rates	Overall Program	• Lack of TOU rate offerings • TOU rates are being implemented across the country	• Request more explanation of Duke Energy's position of not including TOU rates in the pilot at this time ○ Clarification by Duke - ratepayer benefits of customer response to TOU rates	• Consider potential time of use rates for EV after 1st year of the pilot and at the end of the pilot
Rates	School Bus/Transit Bus Pilots	• Lack of consideration of time of use rates • Concern about impact of charging to customer demand charges		• Require separate metering for bus chargers
Technology/ Infrastructure	DCFC Pilot	• Concern about stranded assets and potential costs to ratepayers	• How long will the company maintain the equipment after the 3 year pilot program? • Will the utility provide support for the chargers if they fall into disrepair?	• Utilize Existing Infrastructure - chargers that are out of service as make ready locations • Consider make-ready options / Consider alternatives rather than utility-owned
Technology/ Infrastructure	Overall Program	• Concern about stranded assets		• Consider a customer agreement to keep chargers installed beyond the 3 year pilot

Program Design	School Bus/Transit Bus Pilots		• Can school buses be retrofitted for V2G in year two and still be eligible for program?	
Technology/ Infrastructure	School Bus/Transit Bus Pilots	• Concern about incentives used for prototypes vs. proven bus technology		
Technology/ Infrastructure	School Bus/Transit Bus Pilots	• Concern about compatibility of vehicle manufacturers and chargers		• Consider the compatibility of charging equipment to support different bus manufacturers depending on customer choice of bus • Extend customer choice from hardware only to include networks

Category	Program	Topic in Disagreement	Discussion – As consensus could not be reached on these items, they are not included in the possible considerations for program modifications.
Funding/ Incentives	School Bus/Transit Bus Pilots	Incentive	• Clarify goals related to the School But/Transit Bus program and adjust incentive accordingly ○ Suggestion that if the goal is to study buses, then need to increase funding/incentives to cover the cost of the bus as well as the charger ○ Suggestion to limit the rebate to batteries in the buses in order to meet goals for studying storage capabilities and other charging/battery goals ○ Utility should work with Department of Education for their goals related to electrification of the state's fleet of school buses and ensure the incentives are adequate to drive buying decisions
Funding/ Incentives	School Bus/Transit Bus Pilots	Funding Alternatives	• Utility should consider the following funding alternatives: ○ Utility should consider On Bill Financing options to reduce rate payer impacts by funding the initial upfront cost of the incentive which the customer will pay back over time through their monthly electric bill ○ Utility should consider raising the per bus incentive to cover funding gap from VW funding ○ Reduce the number of buses in the pilot without modifying pilot budget to increase per bus funding
Technology/ Infrastructure	DCFC Pilot	Competitive Market concerns	• Pricing at DC Fast Charges – kWh v. Time v. Free, etc. ○ Different market segments ○ Different benefits and services
Technology/ Infrastructure	DCFC Pilot	Payment Methods	• Discussion/nonconsensus on various payment methods – determined to be a policy discussion as the pilot is limited in scope ○ Concern about customer convenience in payment method available ▪ Swipe vs. Call to process vs. RF reader ▪ Security concerns at EV charging stations about swipe method – disagreement ▪ Swipe method is used in conventional fuel transactions
Technology/ Infrastructure	All Pilots	Customer Choice of Technology	• Disagreement as to which aspect of EV infrastructure is most critical in customer choice – networks or hardware as key decision points ○ OCPP requirement in various programs and limitations to participation due to specific technology requirements ▪ Good for commercial applications but only a few vendors use this platform for residential - Concern about limited providers ▪ Alternative view – valid in the residential market as a protocol ○ Concern about limiting the # of providers

			▪ Providers differ for hardware and software ▪ Argument that the lessons learned which is the goal would be the same if the utility set the requirements for both hardware and software vs. the customer choosing ○ Suggest choice in hardware and Networks ▪ Suggestion to extend customer choice from only hardware to include networks/software as well ▪ Fleet operations and management may have an overall solution preference not compatible with pilot program eligibility criteria
Technology/ Infrastructure	All Pilots	Utility Maintenance	• Can the Utility properly maintain charges?
Program Design	School Bus/Transit Bus Pilots	Length of Pilot	• 3 years could be too long, consider compressing the time for school and transit bus programs to 1-2 years
Program Design	Residential Pilot	Number of Participants	• Various opinions on if the size of program is too small or adequate for the learnings

Detail of the Stakeholder Group Modification Proposal

The working group reached consensus on the proposed modification for Duke Energy to form a Stakeholder Group that would convene annually.

The proposed Stakeholder Group was discussed in detail, including the purpose of the group and recommended participants. The working group determined that the purpose of the Stakeholder Group would be limited in scope to the ET Pilot and would allow participants the opportunity to ask questions, receive updates on projects, and provide comments and potential recommendations on any changes Duke Energy may propose to the ET Pilot. The Stakeholder Group recommends Duke Energy share drafts of any changes to the ET Pilot and be allowed 60 days to respond prior to filing with the Commission.

The working group also recommended that participation in the Stakeholder Group be extended to include consumer representation such as Duke Energy customers participating in the pilot programs with light and heavy duty electric vehicles, municipalities, and transit professionals such as an industry liaison which could add value and perspective to the group and review pilot program outcomes.